MAY, 1959

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EDITORIAL

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THE VALUE OF CONFERENCES

There is nothing as valuable to an institution as its ability to hold regular conferences, whether it be in the form of meetings of members, at a technical level, or at an administrative level. It is only by such means that the requirements of the members of any kind of organisation can be properly discussed and policies affecting its operation determined. This applies to clubs, associations, institutions, business enterprises—in fact to any group of people who form themselves into an organisation to carry on any kind of pursuit whether it be as simple as a sports club or as complicated as an institution with widely spread branches or divisions as in our own Wireless Institute of Australia.

At Easter time, during March this year, the Federal Council of the W.I.A. met around the conference table in Melbourne to discuss and determine many matters which directly concern the licensees of the Australian Amateur Radio Service, short-wave listeners and the general members of the Institute.

The results of the discussions, which covered a particularly broad field of the activities of Amateur Radio operators, were determined by direct representation of members throughout Australia through the office of the Federal Councillor who attended from each State of the Commonwealth on behalf of the members in his Division. Such discussions and determinations would be quite impossible by any other means than a conference. It is only because the delegates can actually meet each other and convey their Divisions' requirements in detail that makes it possible to arrive at satisfactory conclusions to problems that inevitably must arise in an institution as far flung as the W.I.A.

On the occasion of the Conference this year it was more important than ever before that the Federal Council meet at the conference table, for in August commences the Extraordinary Radio Conference of the International Telecommunications Union in Geneva—a Conference of the highest administrative level in our modern world of communications and one which could have far reaching effects on the Radio Amateur Service not only in this country but in every country in the world.

Such are the problems of engineering the radio frequency spectrum on an equitable world wide basis that the possibility of reaching satisfactory conclusions would be completely and utterly beyond the realm of feasibility if it wasn't for the fact that the countries of the world hold a conference. The representatives to an international radio conference directly represent the requirements of their country around the conference table and it is only by this means that any sort of agreement can be reached.

To many who take no interest in the administration of their club, association, institute or other body organised to protect and perpetuate its activities, a conference may seem a boring procedure. But if there was a simpler means by which the same results could be achieved, the funds of such organisations would long ago have been channelled elsewhere.

In the case of international radio conferences the cost runs into astronomical figures but a better solution than a "conference" has never been devised.

FEDERAL EXECUTIVE.

THE CONTENTS

SIMPLE SIDEBAND*

PARTS THREE and FOUR

LESTER EARNSHAW, ZL1AAX

THE PRODUCTION OF S.S.B.
How to Eliminate One Sideband and the Carrier

It is a very easy matter to balance out the carrier of any modulated signal and confound those who insist that a.m. is envelope modulation. (Believe me, there are many who do. I found that out after I wrote Part 1). Fig. 1 shows a circuit which is known as a **balanced modulator**. If you look closely you will see that it is identical with a push-push circuit with which we are all familiar save that in this case the tuned circuit in the plate of the tubes is tuned to the same frequency as that of the grid. You may amuse yourself any old time trying this out on your a.m. rig so long as it has two tubes in the output. If you put the thing on the air you may be surprised to find that you have double sideband suppressed carrier. It is not proposed though to discuss d.s.b. suppressed carrier in these articles, so let's pass quickly.

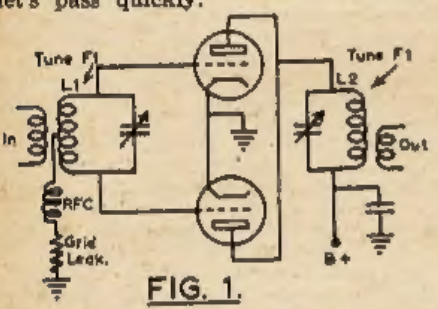

FIG. 1.

The carrier may also be suppressed in diodes, either of the tube type, or of the simple germanium. These are merely connected up in the push-push arrangement we used with the triodes. So the suppression of the carrier offers little difficulty. Indeed, it is simpler than the process of modulation itself, so have no fears on that score.

Removing the unwanted sideband is a different story. It cannot be balanced out as is done with the carrier. This is unfortunate for this would indeed make sideband simple.

There are two methods mainly in use for suppressing the carrier. One method used by telephone companies and Amateurs is the filter method. This may consist of high Q circuits used something like a wave trap. Actually, it's just a little more difficult than that but the principle is identical. The wave trap may take the form of crystals; it may consist of low frequency i.f. transformers, or as in the Post and Telegraph Department, on their carrier circuits, it may use toroidal filters. Whatever the means, the end is the same; the one sideband is filtered off. The carrier may be removed in the same way or it may be removed with the balanced modulator. The filter system is a good one and once constructed seldom requires adjustment. It is not easy to construct though. The various components need very careful adjustment to obtain pleasant quality. The sideband suppression may be made near perfect **at the output of the filters.** I will have more to say about this latter, later.

The other method, and the method I propose to discuss first, is that known as the **phasing**. In this system the audio is divided into two components, usually at a low level, and the phase of one is shifted 90 degrees in relation to the other. Likewise, an r.f. component is divided into two and the phase of one shifted 90 degrees in relation to the other. These four components are then mixed in the balanced modulator which at the same time suppresses the carrier and Bingo! the job is done.

What happens in that little old balanced modulator is very easily explained with a little chalk, a blackboard and a couple of vector diagrams. If, though, I am to get through this course without those, sufficient if I say that the one sideband cancels out. There are some things you need take for granted and unless you are prepared to get stuck into the maths. book, this is one of them. To digress—would you be any better off if you knew where the light went when it went out?

The phasing method is perhaps the simpler method available to Amateurs who would construct their own equipment, for it does use more readily available components. The quality should always be excellent if reasonable design practice has been followed. As against this, phasing rigs require more frequent adjustment and the sideband suppression **at the output of the balanced modulator** cannot be made as good as that from a filter rig. Subsequent amplifiers, though, will, in all cases, degrade the suppression so that the unwanted sideband is **attenuated** by about 35 db. in both cases. Therefore, as far as unwanted sideband is concerned, there is little to pick and choose from in regard to the two methods. This is often a fact which is overlooked yet easily substantiated merely by looking up the third harmonic distortion percentages of various amplifier tubes. At the best, you'll find these around the 35 db. mark.

In a previous article I said that once you got hold of Donald by the neck and peered down his throat, you'd be surprised at what little mechanism there is to cause all the quack. This you will truly realise when you have followed me through the block diagram and circuit, in this article.

Beginning with the mike we come to the audio pre-amp. This may well be ordinary circuitry perhaps borrowed from the a.m. rig, though it is an excellent idea to use a form of audio filter to limit the audio response. This should also be done in a.m. circuits of course, but is not. The same is applicable to s.s.b. Three triodes are a very common pre-amp. arrangement, but any other configuration may be used.

The audio is then fed into a transformer or cathode follower so that the impedance is lowered to somewhere around 500 ohms. This figure is necessary to match up the usual type network available. The next portion of the diagram is known as the **audio phaseshift network.** This network shifts the phase of the two components which are presented by the transformer and about which I am going to say little. Instead I refer readers to the excellent articles written by Noel Southwell, VK2ZF, in "A.R." (August, September, and October, 1957), which cover the matter very well indeed.

A little about phaseshifting in general may not go astray at this stage for I do find that not much is generally known about this subject. If we connect a condenser across a battery it will be found that there will be a sudden rush of current flowing from the battery into the condenser and this high surge will create a voltage drop across the internal resistance or reactance of the condenser which in turn means that though there is a high flow of current in the condenser, the actual voltage there is low. But when the flow ceases the voltage will be high. This then means that when the voltage is high, the current is low, and when the voltage is low, the current is high. These two therefore are out of phase. The same is true of an inductance but in a reverse sense. There the voltage leads the current.

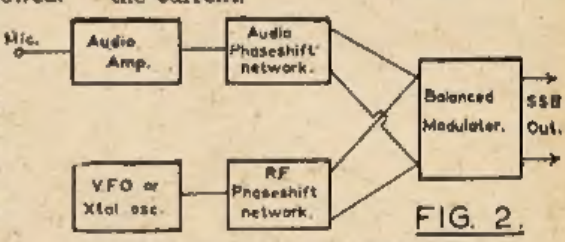

FIG. 2.

A Block Diagram of a Phasing Type Rig.

From this it may be seen that either capacitance or inductance may be used to shift the phase relationship of a voltage and current and this is quite true. Any condenser or inductance will give a phase shift. It is merely a matter of sorting out the condenser or inductance that will give you the required shift.

Getting back to our simple sideband, we arrive now at the balanced modulator in which the carrier suppression and mixing take place. I will give a practical circuit of this later.

Meanwhile, we must have a source of r.f. and this we obtain from a v.f.o. or crystal oscillator. As we did in the audio circuit so do we now divide this into two outputs, shift the phase of one 90 degrees in relation to the other, and then feed both into the balanced modulator. This r.f. phaseshifting may be accomplished much more easily than was the case with the audio because we are dealing now with only one frequency. Whereas in the audio we had to hold the phase constant over a band of frequencies, now we are concerned

* Reprinted from "Break-In," July, Aug., 1958.

only with one frequency at a time. When you install an element behind the radiator in your antenna system, by detuning this element you shift its phase by a factor something like 90 degrees and make it into a reflector. Conversely, when you detune it 90 degrees in the opposite direction you make it into a director. Thus, from this we learn that merely by detuning a tuned circuit that is coupled not too closely to a source of power, so do you alter the phase of the voltage induced into that circuit. And that is the method I propose to use here. There are other ways: You may put a condenser in one leg and an inductance in the other of the two r.f. circuits and accomplish your shift that way, but the method I am using simplifies the modulation of the r.f. for this must still take place of course. You must remember at all times that s.s.b. is a.m. with the carrier and one sideband taken out.

Look now at the circuit diagram of Fig. 3. Into the step down transformer we feed our audio from a pre-amp. The phaseshift network requires an unequal input (ratio 2 : 7) to get equal output. We adjust this with the pot. P1. Then we have an ordinary amplifier tube which has a pot. in the cathode circuit to adjust for different audio outputs from the two tubes. Then come the two 6 : 1 step-down transformers. These two transformers deserve special mention for it is most important that they do not create phaseshift. You have gone to all the trouble of buying or constructing an audio phaseshift and you must not now destroy this. The coil must have ample core area so that it does not saturate under any condition of operation. Cathode followers may be used in place of the transformers but the transformer is simpler and by careful design may be made to shape the audio characteristics. The two 0.005 μF. bypass condensers keep r.f. out of the windings.

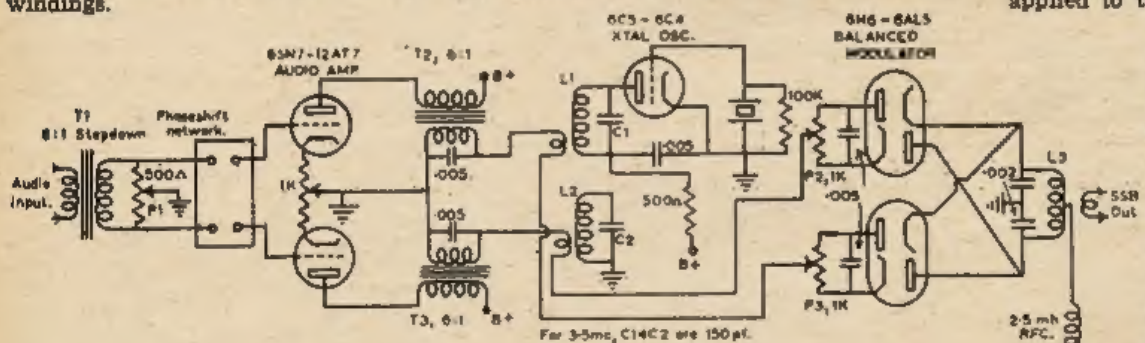

FIG. 3.

No doubt you have already noticed that the transformer outputs each go through a link winding to P2 and P3 at the input to the balanced modulator. L1 is the plate coil of an ordinary crystal oscillator, but well might be the plate coil of a buffer from a v.f.o. or may even be used without the tube and instead link coupled to a Geloso signal shifter as was done in my case for some time. L1 and C1 is merely a source of r.f. and it matters little where the r.f. comes from. If you have a discerning eye you may have noticed that L2 and C2 is not coupled to anything. According to the diagram you would be right, but in practice this coil is coupled to L1 in the manner somewhat similar to the two coils in an r.f. transformer. L2 and C2 is the undercoupled tuned circuit mentioned earlier which is detuned to obtain phase shift.

For 80 metre operation L1 and L2 may be each wound on ½" formers. C1 and C2 may each be 150 pF. and the two circuits grid dipped to 3.8 or thereabouts. The two coils are mounted so that nothing comes between them or within 1" of them and one is placed 1½" from the other. The links are each 6 turns of hook-up wire. But these two coils must not be inadvertently coupled to L3 or any of the output stages. **If there is any coupling between** L3 and either L1 or L2 **you will not balance out the carrier.** P1 and P2 are the pots. which balance out the carrier. You move first one for the null, then the other. Return again to the first and so on.

The balanced modulator is a kind of push-push arrangement as mentioned earlier. Keep lead lengths to its output coil equal and the coil away from surrounding objects. L3 may take any form that strikes the fancy so long as the wire each side of the centre tap is exactly equal. With the condensers shown there will not be many turns. Grid dip the coil to your crystal frequency and you are in business. The link may have two turns of hook-up wire.

This then is the whole means of producing our s.s.b. signal. A 6AG7 output tube tacked on behind and you are in business. T1 might well be the output transformer of an ARC5 (or Command receiver). Some of these receivers have transformers with both low and high impedance outputs. Place say 100 volts of a.c. across the primary and measure the output voltage from the secondary taps until you get the correct ratio. I would not suggest experimentation with T2 and T3 though, for various tests here showed varying amounts of introduced phaseshift and this must be avoided.

If you construct your own network, use only high stability resistors for tests here showed that in three months ordinary components, through absorbing heat and moisture, changed value by as much as 20%. This amount of change will mean that you are on d.s.b. in a big way.

If you use a v.f.o. instead of a crystal oscillator, you must adjust L1 and L2 each time you shift frequency. This may be overcome to a certain extent by connecting a small two gang condenser across the two coils and tuning this to the new frequency. **It is the difference in tuning between the two coils which must remain constant.**

The alternative is to generate the sideband of say 9 megs and then feed the output from the balanced modulator into a receiver mixer valve. By feeding a 5 meg. v.f.o. from say an ARC5 (Command transmitter) into the injection grid, your output i.f.) frequency may be the sum (20 metres) or the difference (80). Now your adjustments need not be altered and secondly, if you use voice control, the crystal oscillator and the v.f.o. may be left running and the mixer circuit switched. This will prevent "tails" as the oscillator dies and will also prevent all sorts of blurps in the receiver.

Lastly, do not underestimate this transmitter. I used exactly the same thing for six months or more, using a Geloso v.f.o. driver link couped to L1. Driving a 6AG7 into an 813, I worked all W prefixes plus KL7s, KH6s and others. This was done on 80 metres.

CIRCUITS PERTAINING TO THE GENERATION OF S.S.B. AND OTHER CONSIDERATIONS

Fig. 4 is the complete circuit of the audio line-up in use at this station. I mention that I have built this circuit in many different rigs now and have found it excellent in all respects. You will find that it is completely free from "bugs" so long as normal wiring precautions are observed and just so long as you use it as it is. Many, to whom I have given the circuit, have introduced little "frills" of their own and then have wondered at the poor reports. For example, if you indiscriminately bypass the cathode resistors you not only completely alter the shape of the audio bandpass, but you give the amplifier more output. To get distortion-free output it is necessary that you have one volt of audio for every 10 volts of r.f. applied to the balanced modulators. If the balanced modulators give insufficient output to drive the following stage, use further r.f. amplification, not more audio amplification.

No doubt you have often noticed that some stations are harder to "tune-in" than others. Assuming the difficulty is not due to receiver adjustment, it may well be that there is a good reason for this. Your audio phaseshift network is designed to pass only a certain band of frequencies such as from 300 to 3,000 cycles, with not more than 1.5 degrees of error. Frequencies above or below this will not be attenuated on the unwanted sideband to lesser or greater extents, dependent on the frequency. Consequently, you will be producing double sideband at the low frequencies and as the two sidebands are, at those frequencies, only cycles apart, you are going to get a peculiar "roll over" effect and of course the phase distortion one always gets with double sideband without carrier unless special detectors are used. This is why—no doubt you have noticed—we use 0.001 μF. coupling condensers and low value grid resistors. The 0.0015 μF. from the grid of V2 (Fig. 4) to ground restricts the top end to

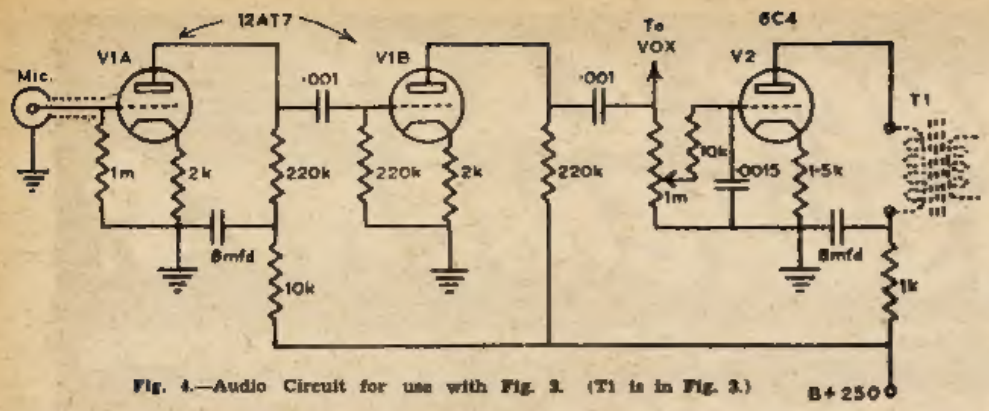

Fig. 4.—Audio Circuit for use with Fig. 3. (T1 is in Fig. 3.)

limit the bandwidth of the signal. A.m. enthusiasts could do worse than to adopt this circuitry for use in their audio pre-amp. stages. They would find a greater freedom from hum and a restricted bandwidth.

If you would further restrict the audio, you might use the filter of Fig. 5. Note that this must be used after a 500 ohm line and be terminated in a 500 ohm impedance. These requirements are satisfied in the s.s.b. circuitry shown.

In the interests of simplicity, Figs. 1, 2 and 3 do not make provision for switching sidebands. All that you need do here is to reverse either the two leads to the primary of T2 (T3 will do if you so choose) or the two secondary leads.

Reversing the secondary may re-introduce carrier, therefore it may be better to do your switching in the primary. If you open the primary of this transformer so that no audio can get to the transformer you will have double sideband. Wind a little carrier in with the pot. P3 and you will have a.m. Actually, this is not amplitude modulation as such, but phase modulation. However, it will sound the same and that is the main consideration.

In case your crystal should stop oscillating I would suggest that you put a 1K resistor bypassed by a 0.005 μF. condenser in the cathode of the 6C4. If the crystal "flops out" the tube plate will dissolve rather quickly. From experience gained here, if the plate dissolves, you are finished with that tube!

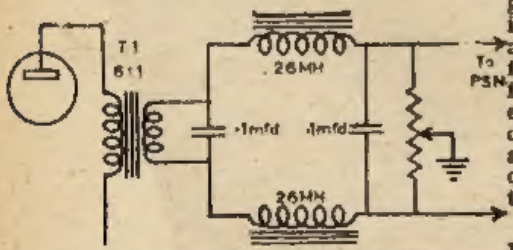

Fig. 5.—Audio Filter restricting bandwidth, 300-3,000 ohms.

Fig. 6 shows the circuit of an r.f. amplifier which may follow the balanced modulator. This amplifier will give several watts' output and is sufficient to drive the final I will give in a later issue. In dealing with r.f. amplifiers that are designed to amplify r.f. signals without carrier or with carrier but in a linear manner, there are one or two points I will make. These are very important points and are the cause of more frustration to those who build their own exciters than anything else I know.

(a) The amplifiers must be extremely stable.
(b) As above.
(c) As above.

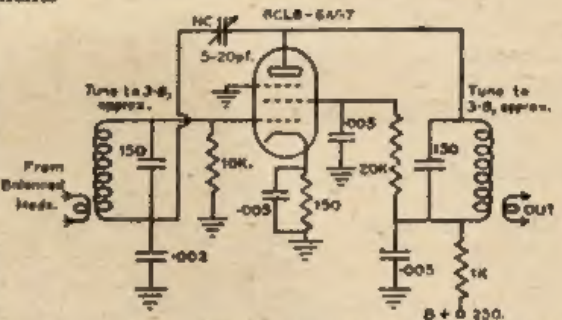

Fig. 6.—Neutralisation may not be necessary with good layout.

I repeat this to show just how important it is. To give you an idea: If your amplifier is not stable you may not be able to balance out the carrier. Also, you may generate a carrier with or without modulation on a frequency far removed from the operating frequency. A friend of mine who was operating on 40 metres caused QRM to shipping channels on 600 metres! When your carrier is balanced out there should be no indication of output of any sort, not even with a diode field strength meter coupled close to the final. Incidentally, next month I will give the circuit of a suitable carrier indicator. In addition to self-oscillation at low frequencies, amplifiers must be free from parasitics. Parasitics, apart from producing signals perhaps 50 kc. each side of the intended signal, may cause a hum not unlike v.f.o. hum in a.m. Alternatively it may cause frequency modulation due to feedback to the oscillator.

Your amplifiers must be properly loaded, otherwise "flat-topping" may occur. Just as Inland Revenue Dept. is a nice name for Tax Dept., so is flat-topping a nice name for splatter! It is even more important to load your s.s.b. amplifier than it is your amplifier. What happens is that when a signal is applied to the grid the plate current in the final goes up. If the load is not sufficiently high the plate current is not able to rise further, yet the signal at the grid does so. The top of the signal is squared off in the plate circuit and you get a square wave. A square wave is composed of an infinite number of harmonics, and . . . well, you should be able to work that out for yourself

The amplifier I have shown should run Class A, which means that it should never run into grid current. It is designed for Class A operation and should stay that way. The coils, etc., are exactly as for a.m. and no further comment.

Next month I will endeavour to give the adjustment of the phasing type rig. The adjustment will mostly concern those which use the twin coil system of obtaining the r.f. phaseshift but if you separate the oats from the chaff, you will find that it applies equally as well to all phasing type rigs.

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Solid State Radio Frequency Amplifiers

PART TWO

C. S. RANN,* VK3AAK

PARAMETRIC AMPLIFIERS

IN the first article of this series a description was given of the operation of a maser solid state amplifier. At the present stage of the art it would be rather impractical for any independent experimenter to undertake the construction of a maser amplifier due to serious practical difficulties such as the use of liquid air. The amplifier to be described in this series, however, is well within the bounds of Amateur construction; furthermore, this type of amplifier is only in the initial stage of development so Amateur experimenters could perhaps contribute some useful ideas.

The amplifier is referred to as a "parametric amplifier," "reactance amplifier" or a "MAVAR"—a recently coined acronym for "Mixer Amplification by Variable Reactance." The original idea was suggested as long ago as 1916, however the present types of amplifiers have only evolved within the last few years.

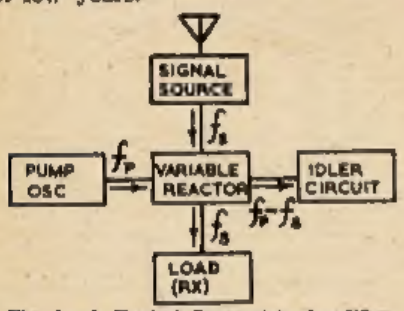

Fig. 1.—A Typical Parametric Amplifier Circuit.

The amplifier is shown diagrammatically in Fig. 1 and Fig. 2. There are three tuned circuits; one circuit is tuned to the pump oscillator frequency as in the maser, another circuit is tuned to the signal frequency, and the third circuit is tuned to the "idler frequency", the purpose of which will be described later. The three circuits share a common reactance, shown here as a condenser. This reactance is called a "varactor" (variable reactance) and is the heart of the amplifier. The varactor must have a non-linear characteristic, i.e. if it is a condenser, the non-linearity exists between the charge on the condenser and the voltage across it. If the varactor be an inductance, then the non-linearity exists between the flux and the current through the coil. The most convenient varactor at present appears to be a back biased diffused junction silicon diode. The capacity of such a diode varies with the applied back bias voltage due to the change in the width of the depletion layer at the junction of the diode. For examples of suitable diodes, see "QST", Feb. 1959. It should be pointed out that the diodes used in u.h.f. mixer circuits rely on non-linear resistance characteristics and in general, no gain can be had from them in parametric amplifier use.

*2 Georgiana St., Sandringham, Vic.

The pump oscillator, as in the case of the maser, provides power which is converted to the signal frequency and provides amplification. The amplifier can exhibit negative resistance when operated in a certain way, this leads to amplification by regeneration. Operation by a different method leads to an "up converter" which can show a useful gain without resorting to regeneration. Amplifiers have been constructed showing gains of 20–30 db. and noise figures of about 1 db.

HISTORICAL DEVELOPMENT AND RELATIONSHIP TO A MODULATOR

An explanation of the reason these amplifiers show gain would involve a digression into the fourier summation of the various frequencies involved. I will try, however, to give a description using simple modulation theory. This approach is actually similar to that of the early investigators who developed the theory of this type of amplification. Hartley, in 1936, described a capacitance modulator using a moving plate condenser, the capacity of which varied with the sound waves of the voice. The capacity of this condenser controlled the power, at the signal frequency, to be passed to the output. He showed mathematically that the modulation could under certain conditions become unstable. If the radio frequency current being modulated were increased in power the moving plate condenser could be made to burst into mechanical oscillation at an audio frequency. Later Hussey and Wrathal verified experimentally that this was so.

Since that time interest has seemed to lapse. The results were applied in the case of magnetic amplifiers to explain spurious effects, but in general the electronic engineers have been too preoccupied with new fields such as microwaves, computers, etc., to investigate this effect which on the surface would not appear to have many practical applications. Recently, however, the subject has been revived because of the problems of obtaining low noise amplifiers in the v.h.f. and u.h.f. region. At these frequencies there is not much external noise to be received and it becomes possible to detect very weak signals if equipment is available which is free of noise. Unfortunately electron tube amplifiers lead to no further gain than simple crystal mixers. This is because they generate noise internally, so in spite of the amplification they perform on the signal the resulting signal-to-noise ratio is the same or worse than that coming in from the aerial. Parametric amplifiers utilising these earlier effects are able to eliminate electron tubes from the front end of a receiver, the amplification being obtained with low noise solid state devices such as the crystal diodes mentioned. It may be said that the wheel has completed a turn and we are once again back to crystal sets, even though we may have to look hard to recognise them.

Getting back to the explanation of the amplifier we can start by considering an amplifier as a modulator. That is, small power alternations at the signal input frequency cause variations in the amplifiers energy source resulting in the flow of higher power alternations at the amplifier output. The energy source of the conventional amplifier is a direct current, and the output should be a higher power replica of the input signal. If this direct current energy source is regarded as an alternating current source of zero frequency, we can then see that the usual amplifier is only a special case of a more general series of modulators in which the modulator energy is an alternating current. The special properties of variable reactance type modulators are less widely known than the more conventional type of modulator. These properties will now be described, and they provide the fundamental working principles of the parametric amplifier.

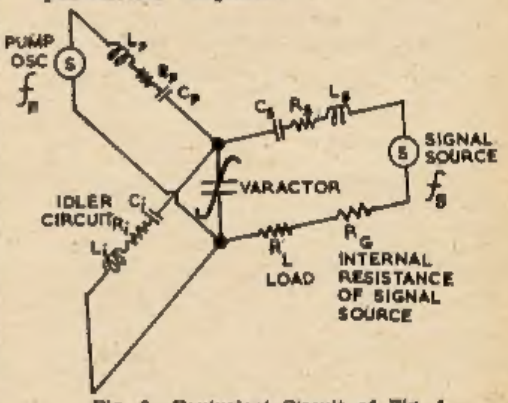

Fig. 2.—Equivalent Circuit of Fig. 1.

GENERAL THEORY

The general case of the mixing of two alternating currents through a non-linear reactance leads to the generation of an infinite series of beat frequencies. These are the sum and difference beats of the two signals mixed and all of their harmonics. If we confine our attention to the simple case of only four frequencies, namely the two signals being mixed and their sum and difference, then we can use two important results from the earlier work of Hartley.

(1) The two signals applied to the non-linear reactor supply power unequally, the ratio of these two powers being greater than the ratio of their frequencies. If one signal source has a much higher frequency than the other, it will supply most of the power to the modulator, the low frequency source will supply very little power.

(2) The power available at the sum frequency of the signals mixed, comes from both generators, i.e. this power is equivalent to a positive resistance in the circuit of both the sources. In the case of the difference frequency however, power is absorbed from the higher frequency source but not from the lower frequency source, in fact power is actually given to the low frequency source also; i.e., absorbtion of power at the difference frequency introduces a positive resistance into the high fre-

quency source and a negative resistance into the low frequency source.

The two equations given below give the power relationships between these frequencies, the only restriction being that the non-linear reactance be single valued, i.e., no hysterisis effect. The results are independent of the power of the two mixing signals, and the shape of the non-linear characteristic.

If P_h = power of higher frequency f_h,
P_l = power of lower frequency f_l,
$P+$ = power at frequency $f+ = f_h + f_l$,
$P-$ = power at frequency $f- = f_h - f_l$.

$$\text{Then } \frac{P_h}{f_h} = -\frac{P+}{f+} - \frac{P-}{f-} \quad \ldots\ldots\ldots (1)$$

$$\frac{P_l}{f_l} = -\frac{P+}{f+} + \frac{P-}{f-} \quad \ldots\ldots\ldots (2)$$

UP-CONVERTERS

If after mixing the two frequencies f_h and f_l we extract power at frequency $f+$ both the source of f_h and of f_l supply power. In this case no power flows at $f-$, hence $P-$ is zero. For $P- = 0$ the circuit must show an open or a short circuit at this frequency. For this set of conditions the master equations (1) and (2) can be re-written.

$$\frac{P_h}{f_h} = -\frac{P+}{f+} \quad \ldots\ldots\ldots (3)$$

$$\frac{P_l}{f_l} = -\frac{P+}{f+} \quad \ldots\ldots\ldots (4)$$

The algebraic sign of each term is important, if power is going into the unit it is positive, if it is being extracted from the unit it is negative. In equations (3) and (4) it is obvious that for power to be extracted at frequency $f+$, power must come from the power sources of frequencies f_h and f_l which are both positive. These equations are in the most general form deliberately; in an actual practical example we could make the following transformation:

f_h = frequency of pump oscillator.
f_l = signal frequency from aerial.

Then using equations (3) and (4) we have f_h and f_l both positive as they are feeding power into the varactor. At frequency $f+$ $(= f_h + f_l)$ is a tuned circuit taking power from the varactor, hence $P+$ is negative. This example is actually a modulator (usually called an "up-converter") and it can be made to give considerable conversion gain. Using equation (4), gain $G = -(P+ \div P_l) = (f+ \div f_l)$, hence the further apart the signal frequency and the sum frequency, the greater the gain of the unit. In this example to obtain the original signal we would have to demodulate at frequency $f+$, with a high frequency receiver. The gain in power at the frequency $f+$ has been obtained mainly at the expense of the source of power of the amplifier, i.e., the pump oscillator at frequency f_h. Reference to Figs. 3 and 4 should demonstrate the types of modes usually used and discussed in this section.

Before passing on to the next basic type of converter it should be pointed out that these equations also apply to demodulators. In the case of a demodulator, the signal comes in at $f+$ and the output is at f_l. The gain on demodulation $-(P_l \div P+) = (f_l \div f+)$ is unfortunately less than unity.

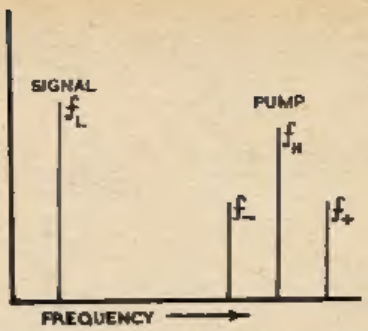

Fig. 3.—The case of a high pump frequency.
(1) If power is absorbed at f—
(a) And output taken at fl regenerative r.f. amplifier.
(b) And output taken at f— regenerative up-converter.
(2) If power is absorbed at f plus
(a) Output taken from f plus up-converter.

STRAIGHT AMPLIFIER

If instead of extracting power at $f+$ we extract power at $f-$, we get a different set of equations from (1) and (2). As $P+ = 0$, we get:

$$\frac{P_h}{f_h} = -\frac{P-}{f-} \quad \ldots\ldots\ldots (5)$$

$$\frac{P_l}{f_l} = \frac{P-}{f-} \quad \ldots\ldots\ldots (6)$$

In equation (6) it is seen that P_l and $P-$ are of the same sign, hence if power is extracted at $f-$, then $P-$ is negative and P_l will then become negative, i.e., power will leave the varactor at f_l, thus negative resistance and regeneration can be introduced at the signal frequency f_l. If regeneration is present the gain depends on this coupled with the various losses in the amplifier, and the equations are not used. Examination of equation (5) shows that the power for regeneration is obtained from the pump oscillator at frequency f_h.

It should be noted here that power must be absorbed at frequency $f-$ to get regeneration at frequency f_l, the signal frequency. The tuned circuit in the amplifier absorbing power at $f-$ is called the "idler circuit", as it does not seem to be doing anything. It will be apparent, however, from the equations that if power does not flow at this frequency no regeneration will occur at the signal frequency.

The amplifier described in this example seems to be the "original" parametric amplifier. It is virtually a regenerative r.f. amplifier of very low noise,

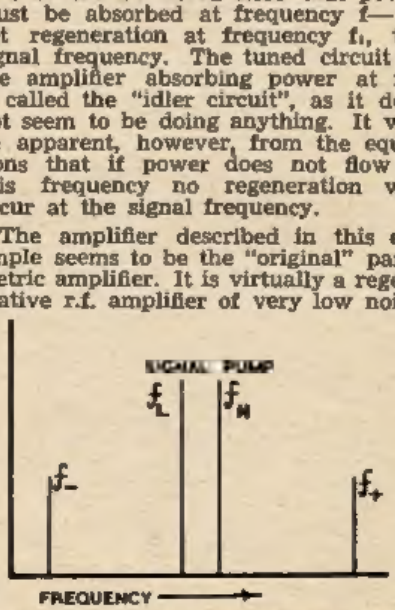

Fig. 4.—Signal and pump frequencies close together.
(1) If power is absorbed at f—
(a) And output taken at fl regenerative r.f. amplifier.
(b) And output taken at f— regenerative down-converter.
(2) If power is absorbed at f plus
(a) And output taken at f plus up-converter.

with the degree of regeneration controlled by the power from the pump oscillator. The main objection to this type of amplifier is that it is likely to break into oscillation at very high gain, and being regenerative, the bandwidth will be correspondingly narrow.

DOWN-CONVERTER

In the example of the previous straight amplifier we saw that power could be extracted from the varactor at two frequencies f_l and $f-$. We took the output from f_l which was the signal input frequency. The output could be taken from $f-$, again using regeneration to provide the gain. In this case the signal has been converted downwards, hence the designation "down-converter".

There are so many combinations that can be worked out in these converters that the nomenclature is becoming confusing. Whenever the output is below the signal frequency however, we have a down-converter unit of some sort. An interesting attenuator is described in "QST", Feb. 1959 in which a down-converter is run in a stable mode with the pump oscillator at a lower frequency than the signal. The gain or actually attenuation is $f- \div f_h$, in this case f_h is the signal frequency. (The sign convention is opposite to the one used in the "QST" article.)

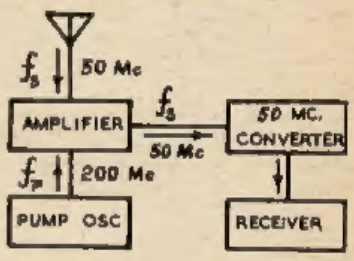

Fig. 5.—System for a Straight Parametric Amplifier.

GENERAL DESIGN

The diagrams should help clarify the various types of converters, and the general theory should help the understanding of any converters that have not been described. Before giving some examples from the literature, one more design point should be mentioned. In the above discussion four frequencies only have been manipulated. In the general case as mentioned before there are an infinite number of sum and difference frequencies resulting when two signals are mixed. These are given by $X f_h \pm Y f_l$, where X and Y are interger numbers representing the various harmonics. In normal radio practice, as in the above discussion, the only sum and difference frequencies used were those where both X and Y equalled one. In designing parametric amplifiers, however, there are sometimes advantages in picking higher members of the series. An example of this will be given where the pump frequency is below the signal frequency. In this case an electron tube pump oscillator may not be able to oscillate at an extremely high frequency as required by the normal operation of a parametric amplifier. The lower frequency pump mode of operation would then permit an amplifier to be constructed at these super high frequencies.

EXAMPLES OF AMPLIFIERS

Some examples from the literature may help to clear up any hazy thoughts on the subject.

Reactive Up-Converter: This mode of operation has not been examined in the foregoing discussion. A diode type amplifier receives the signal at 900 Mc. (f_1), mixes it with the pump oscillator at 9,900 Mc. (f_p) to give a signal at 9,000 Mc. ($f-$). This signal at 9,000 Mc. is then mixed with a 9,070 Mc. local oscillator producing a 70 Mc. intermediate frequency signal. The noise figure for this unit is less than 1 db. The unit has a conversion gain of 18-20 db. and is used for tropospheric scatter communication.

On a 250-mile path the use of this unit enabled a cut in transmitter power from 10kw. to 1kw. Whilst this unit is an up-converter, it is regenerative because power is extracted at $f-$. It is rather similar to the down-converter in this respect. Presumably the unit could also have been used as an r.f. amplifier at 900 Mc., but would most likely have had a poorer noise figure.

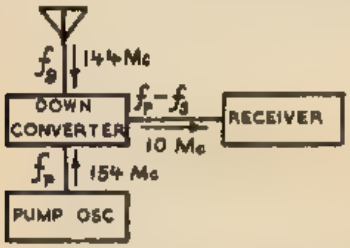

Fig. 6.—System for a Down-Converter.

Standard Parametric: A cavity was made resonant at 3,600 Mc., 2,800 Mc. and 1,200 Mc. A diode was placed within the cavity and a pump power of 100 mw. at 3,600 Mc. (f_3) caused oscillations to occur at 2,800 Mc. (f_1) and 1,200 Mc. ($f-$). On reducing the pump power, amplification was obtained from either of these frequencies. Bandwidth at 19 db. gain was 1 Mc., at a power output of 1.5 mw. The noise figure was 4.8 db.

Parametric with Lower Pump Frequency: This amplifier again used a diode as the varactor. The signal was at 380 Mc. and the idling circuit at 220 Mc. The pump oscillator was at 300 Mc., a second harmonic of the pump virtually being used in order to get an idling frequency of 220 Mc., i.e., $f- = 2\ f_1 - f_s$. $f- = 2 \times 300 - 380 = 220$ Mc. This amplifier gave a stable net gain of 20 db. at 380 Mc., using a pump power of 30 mw. Strong oscillations commenced at 380 Mc. when the gain was made to exceed 40 db. The noise figure was 10 db. and the bandwidth 1 Mc.

The amplifiers described in this article bear little resemblance to the example described in "CQ", Nov. 1958, in which only one tuned circuit is used for the whole amplifier. This is a particular case of the general theory in which the signal frequency and the idler frequency are the same. It is usually referred to as the "degenerate mode" and has several attractive features. It has been proposed mathematically that it contributes less noise, and it also is more convenient to construct having only one tuned circuit. There is no tuned circuit for the pump oscillator, it is fed straight onto the varactor by a co-ax cable from the oscillator. The pump frequency is twice the signal frequency as shown by the general theory.

$$f- = f_s - f_1$$

then pump frequency $f_s =$

$$f_1 + f- = 2\ f_1$$

as $f- = f_1$.

The pump frequency could, of course, be any other frequency predicted by the general theory, and it is quite possible that a lower noise figure could be obtained by using much higher pump frequencies.

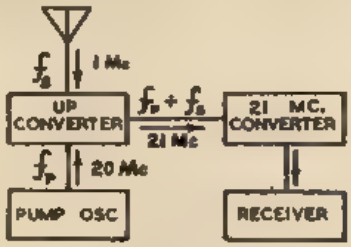

Fig. 7.—System for an Up-Converter.

CONCLUSION

These examples should suffice to illustrate the many combinations of frequencies that can be used in designing out a parametric amplifier. When designing your experiments remember all other frequencies except those in use should see either an open circuit or a short circuit. Very strange spurious effects may result if power at any of those many sum and difference frequencies is allowed to flow, or unwanted noise could be introduced.

This review article has only dealt with a few types of the many described elsewhere, so a study of the literature would be well worthwhile. Also, it will be noticed in so doing that the nomenclature associated with the components and the various types of amplifiers has not been standardised. In this article the most commonly used words have been applied. No attempt has been made here to describe a practical amplifier. Descriptions of practical amplifiers have been published, but there are not many descriptions of the basic theory available good enough to explain the multitude of receivers being described, or to allow the design of an experimental amplifier.

The amplifiers described at present are quite likely to be obsolete in a few years. Electron beam mavar tubes are under construction in which an electron beam is used for the coupling in place of the varactor. Ferrite loaded coils are also being used, in which various ferro-magnetic resonances are excited. It is logical to assume that more efficient varactors will be developed, and be used in better designed amplifiers. At this stage all one can say is that there still remains a lot of experimental and developmental work to be done, and it is hoped that the experimentally-minded Amateurs will contribute. In the future, maybe, the pages of this magazine will contain many articles concerning experiments and construction of these amplifiers.

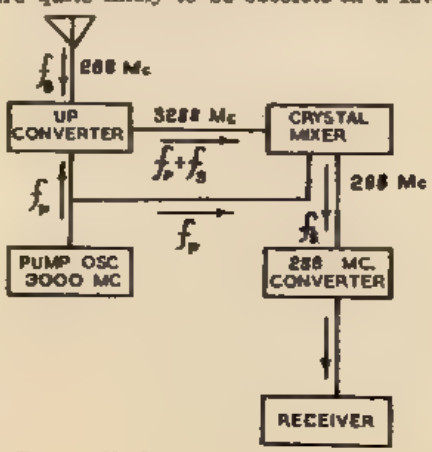

Fig. 8.—Up-Converter using unstabilised pump oscillator.

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11. "Gain and Noise Figure of a Variable Capacitance Up-Converter," Leenov, Bell Systems Tech. Jour., Vol. 37, July 1958.

D.X.C.C. LISTING

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK6RU	3	224	VK6KW	4	184
VK6MK	43	216	VK3BZ	3	176
VK4FJ	21	213	VK4RW	23	164
VK3WL	14	211	VK3EE	10	163
VK3ATN	26	204	VK9DB	31	161
VK4HR	12	192	VK4WF	16	160

Amendments

VK3ACN 39 120

C.W.

Call	Cer No.	C'nt-ries	Call	Cer No.	C'nt-ries
VK4FJ	29	248	VK3XU	48	213
VK3KB	10	245	VK3NC	19	206
VK3CX	26	240	VK3YL	39	203
VK3FH	15	228	VK5BY	45	202
VK3BZ	6	222	VK6RU	18	198
VK4HR	6	218	VK2EO	3	191

OPEN

Call	Cer No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK4FJ	53	251	VK3XU	61	221
VK2ACX	6	250	VK6MK	74	220
VK6RU	8	246	VK3HG	3	215
VK4HR	7	233	VK3JE	12	210
VK3BZ	4	231	VK3ATN	69	210
VK3WL	46	225	VK3NC	77	209

BOOK REVIEWS

"CQ" NEW SIDEBAND HANDBOOK

Don Stoner, W6TNS

The author, W6TNS, has set out to cover the whole subject of Amateur sideband in this handbook. The entire book is written in a very easy style with a complete absence of maths. and contains much of what the author calls "sugar coated theory".

The handbook is divided into eight chapters in logical sequence. Of particular interest are the chapters entitled "What is Sideband?", "Double Sideband", "Balanced Modulators" and "Receiving Sideband".

Almost all of the material in the "New Sideband Handbook" has not previously been published. A very good collection of circuit diagrams has been given including several extracted from various items of commercially made Amateur equipment. A number of constructional articles is included, but, as is usual in most publications originating overseas, some of them are not suited to our conditions here. Of particular local interest should be the practical articles in the chapters on "Double Sideband" and "Linear Amplifiers", an s.s.b. receiver built around a BC453 Q-5er and a "driftless" v.f.o.

The book is very well presented and the circuit diagrams clearly drawn. It may be recommended as an ideal introduction to sideband for the newcomer to this mode of transmission and reception and the wealth of information it contains should be very useful to even the most experienced "sidewinder".

Publisher: Cowan Publishing Company, New York. Australian price 31/- plus 1/- postage. Our copy from Technical Book and Magazine Co., 295 Swanston St., Melbourne, and McGill's Authorised Newsagency, 183 Elizabeth St., Melbourne.

THE RADIO AMATEUR'S HANDBOOK

The American Radio Relay League announces publication of the 1959 thirty-sixth edition of The Radio Amateur's Handbook (746 pages), the standard manual of Amateur Radio communication. Published continuously since 1926, the Handbook is a much-used reference work that has proven invaluable to many thousands of Radio Amateurs, Experimenters, Students and Engineers. A best-seller in every sense of the word, over three million copies have been sold in the thirty-odd years it has been published.

Its sections on the theory of radio communications have been brought up to date to keep abreast of the state of the art; and material on the construction of equipment includes new designs in all the categories. There are receivers for both the beginner and the advanced constructor; transmitters for every level of power and frequency range are described.

Special methods of Amateur communication, such as sideband and radioteletype, are treated in sufficient detail so that any student of the art will be able to understand the basic principles. The theory and practice of mobile radio equipment is thoroughly covered, including the fundamentals of transistor power supplies.

The important section on vacuum-tube characteristics has been completely revised and made current. It provides one of the most complete listings of vacuum-tube characteristics and tube-base diagrams to be found between the covers of any one book.

As it has for a number of years, the Handbook also contains a large catalogue section, featuring communications equipment of the nation's leading manufacturers. In most cases, complete specifications and measurements are given to assist the constructor.

Publisher: American Radio Relay League, Australian price 46/3 plus 2/3 postage. Our copies from Technical Book and Magazine Co., 295 Swanston Street, Melbourne, and McGills Newsagency, 183 Elizabeth St., Melbourne.

PERFORMANCE-TESTED TRANSISTOR CIRCUITS

By Sylvania Electric Products Inc.

A booklet of over fifty pages packed with information for the experimenter. Our copy from McGill's Authorised Newsagency. Price 4/6 plus 9d. postage

AMECO AMATEUR RADIO THEORY COURSE

By Martin Schwartz

Here is a complete theory course for those who are studying for the A.O.C.P. examination.

The course is divided into three parts. The first section takes in all the necessary a.c. and d.c. theory. The second is devoted to vacuum tubes and their uses, while section three discusses transmitters, receivers, antennae and regulations. As the book is published in the United States the regulation chapter will have to be eliminated from study and the P.M.G. Handbook for the Guidance of Amateur Operators substituted.

At the end of each section there are a number of practice questions which will check your knowledge.

This book covers all you will need to know to pass the A.O.C.P., and is written in an easy to understand way.

Our copy from the Technical Book Co., Swanston St., Melbourne. Price 45/6.

COMMAND SETS

This excellent book encompasses in one volume most of the data printed in "CQ" on the Command series of transmitter and receiver conversions, and gives all the original circuit diagrams, plug connections, etc.

Some conversions selected at random include 80, 40, 20, 15 or 10 metre operation, keying filter, break-in, band-spreading, crystal control, ideas for mobile work, using as a v.f.o.; tuning knob, crystal converter, double conversion, noise limiter, Q-Fiver, improving signal-noise ratio. Also given are suggestions for modulators and power supplies.

As the Command units are still available from disposal sources this book should be invaluable for those Amateurs who are looking for conversion data.

Several articles on t.v.i. proofing Command transmitters are included which would be of great assistance in laying the t.v.i. bug.

All in all a very handy book to have in the Amateur library.

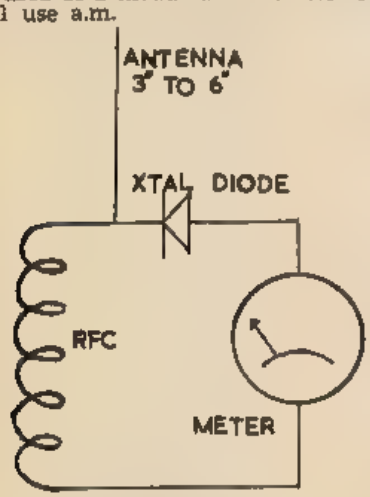
Publishers, Cowan Publishing Corp., New York. Australian price: 19/6 plus 1/- postage. Our copy from McGill's Authorised Newsagency, 183 Elizabeth St., Melbourne, and Technical Book and Magazine, Co., 295 Swan St., Melbourne.

THE INSTANT R.F. INDICATOR

K. B. POUNSETT,* VK2AQJ

THIS very handy item of test equipment is as simple to make as a cup of instant-coffee and takes less time. You don't have to wait for the water to boil! In addition to this, the indication is instantaneous compared to a thermo-couple r.f. meter which always lags that critical adjustment one is making. The instrument is by no means a new idea, it is probably a lot older than I am. Why it does not enjoy a greater degree of popularity amongst the fraternity is a mystery.

Three components are all that are needed, an r.f. choke, a crystal diode and a meter of about 1 mA. full-scale deflection. A more sensitive meter can be used but care must be taken not to overload it. My indicator was mounted in a small metal box that I made several years ago and is just large enough to take the three components. A pin-jack at the rear serves as an antenna connector. If you wish, you may add a phone jack as it may then be used as a modulation monitor if you still use a.m.



THE INSTANT R.F. INDICATOR

The uses to which this instrument can be put are many. It can be used as an output meter for the transmitter and if used in the same spot in the shack and with the same length of pick-up wire, it will show any changes in your transmitter or antenna system from day to day. I have found that used as an output meter, the transmitter and antenna coupler can be tuned to squeeze the last drop of r.f. from the equipment. It can also show if the various combinations to which one can tune a pi-coupler are putting out r.f. or not.

I have also found it most useful in tuning up my s.s.b. equipment. By introducing a small amount of tone into the speech input and aligning all the circuits for maximum output, it is a very positive indication that the transmitter is delivering the goods. I use d.c. meters mainly to remain within the safe ratings of the tubes and to stay under the legal limit.

In receivers and other equipment, it can give indications that the various oscillators are working. Also r.f. on house wiring, piping and other places, such as t.v. and b.c. antennae, can be detected. Recently I had need to cure instability in a 14 Mc. class A driver amplifier in my s.s.b. rig. The pick-up wire was placed near the plate circuit of the amplifier and without drive being applied, the meter showed that r.f. was present. By applying a few general-rule remedies, I was soon able to effect a cure.

For the Ham who likes to experiment with beam and mobile antennae, this instrument can be used as a field strength meter, with excellent results, especially if a 100 μA. movement is used, as this greatly increases the sensitivity. Standing waves can also be investigated on feeder lines if you can reach that high! It can also be used as an r.f. indicator when neutralising an amplifier, BUT do not forget to remove the high voltage from the plate tank

No doubt there are other instances that I do not call to mind, but if you ever have reason to detect the presence of r.f., this is the cheapest way out. It will cost you less if you use your multimeter as the indicator, but I prefer to use the separate meter as I use the Instant R.F. Meter as an ON-THE-AIR indication

* 22 Seiffert Centre, Queanbeyan, N.S.W.

2nd ANNUAL CONVENTION OF WIRELESS INSTITUTE OF AUS.

Held at Perth, W.A., during August, 1925

Back Row (left to right): W. Phipps, VK6WP, Queensland Representative, W. E. Coxon, VK6AG; A. E. Stevens, VK6BN; F. H. Goldsmith, Official Reporter; J. C. W. Park, VK6BB, Hon. Secretary; F. H. Narroway, Hon. Treasurer.
Front Row (left to right): P. Oakley Fysh, VK7PF, Tasmania; Jermyn Masters, VK3LM, Vic.; B. M. Holt, M.I.E.S. (Eng.), Chairman, President W.A. Div.; H. A. Stowe, VK2CX, New South Wales; Clement E. Ames, VK5AV, Sth. Aus.

U.S.S.R. INTERNATIONAL C.W. CONTEST

Short wave Radio Amateurs of the world are invited to take part in this Contest organised by the U.S.S.R. Central Radio Club. There is a listeners' section referred to as "Observation."

A Radio Amateur of any country should score as many points as he can for contacts with Radio Amateurs from different countries, participating in the Contest, or for observations of contacts established between other Amateurs.

Time of the Contest will be 2100 GMT on May 9 to 0900 GMT on May 10, 1959, on 28, 21, 14, 7 and 3.5 Mc. bands, on telegraphy only.

All participants should exchange six-digit control numbers made up of RST and the ordinal number of the radio contact, e.g. 599001. General call sign during the Contest will be CQM (Peace)

Only one radio contact with the same radio station will be taken into consideration. In the case of observation, each radio station participating in the Contest may only be logged once. Contacts and observations within the same populated area will be disregarded. The list of countries is that internationally used by Radio Amateurs.

The results obtained by each Radio Amateur in the Contest will be appreciated by the number of points scored for contacts with Radio Amateurs from foreign countries, including his own country, or for observations of contacts between other radio Amateurs. Each contact (observation) will yield one point. The total number of points gained by a participant will be multiplied by the number of countries he established contacts with, or which contacts he observed. Awards will be issued to winner in each country, likewise for listeners' section.

Logs should be mailed to the Chief Judging Board not later than May 15, 1959. Address, Post Office Box 101, Moscow, U.S.S.R.

Logs to include call sign, name, country, the town of, transmitter (watts), antenna, receiver, and made out in seven columns thus: Date, band, time, station worked, number received, number sent, points. At foot of page: number of points for contacts, number of countries, total number of points. Signature and date. Listeners should not fill in column 6 (that of number sent).

CORRESPONDENCE

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

TRANSISTOR DX

Editor "A.R.," Dear Sir,

You may be interested to hear of a QSO which may well constitute a record. During the evening of April 2, 1959, I was in contact with VK3AN on approx. 7005 Kc. and about 8.15 p.m. when he asked me to have a listen for his small crystal controlled two-stage transistor transmitter which was operating from a 6 volt supply. The input to the final was 3.6 (three point six) m.W. Sure enough there he was, calling me and coming through at RST 4/5-4-0 just like a weak "W".

Alan VK3AN was pretty excited and as for me, well it took me back to the old days of 1925 when as A2YB I used to work with my UV199 and 90 volt "B" battery.

To keep the record straight I told Alan to ask me a question on his transistor rig just to see how well he really was getting out, and when to his question, "How old are you?" I came back with "Fifty, hi, hi," I could almost see him doing handsprings in the shack.

Now, Mr. Editor, I must say that this little episode on "Old 40" gave me more satisfaction than a new country on 20 and proves that in Amateur Radio the unexpected is always turning up. Somehow I think it will be a sorry day when there are no more "key pounders" left in the ranks!.

—Ted Cawthron, VK3JE.

THAT WORD "HAM"

Secretary, Federal Executive, W.I.A.,

Dear OM,

I am pleased to see, by current newspaper publicity, that the Institute has decided to set its own course of action and depart from what has been recognised by all other Radio Societies throughout the world for the past 30 years or more—I refer to the use of the word "Ham".

Whilst I disagree with the Institute decision, it is refreshing to find that it is willing to make decisions of this nature.

Now, PERHAPS, something might be done in regard to the list of countries for the DXCC, in which the W.I.A. stands on its own—years behind the times.

—Alan G. Brown, VK3CX.

DX OPERATING

Editor "A.R.," Dear Sir,

Referring to your remarks in April "A.R." it is not correct to describe present day world wide DX working as an "obsession". Rather, it is a very intelligent phase of Amateur Radio. DX has not "killed short range, friendly, casual contacts" either. Your quotation may have applied in the U.S.A. in 1926 when it was written, but not in 1959.

Every Amateur is entitled to choose whatever field of activity appeals to him. Maybe in 1926 it was practicable to engage in the lot, but not in 1959.

A study of present day DX operating provides a wide field to which any Amateur may well confine his activities and it is most important to remember that the DX bands are provided and should be fully exploited for this purpose. When not open for DX, these bands are often useless for local contacts.

Your article contends that "local, friendly contacts built up the wonderful spirit of the Amateur body, etc." in 1926. Now extend your idea to present day DX and you have the 1959 world-wide version.

As you quote A.R.R.L. as your authority (with which I entirely agree), may I elaborate on the theme?

Much has been written in "A.R." on the subject of DXCC Rules, and in my view the only reference that came to the point was one by the Awards Manager that an attempt was being made to obtain uniformity through the I.A.R.U. I believe this has failed.

There is only one real approach to this matter. What we want is uniformity with the A.R.R.L. I am not influenced by any argument that we cannot have their Rules or that our DXCC is of necessity something different.

The A.R.R.L. Rules are the only ones soundly based, always up to date, and administered by experts. They are treated as standard by Amateurs all over the world. The only sensible thing to do is to arrange for uniformity with A.R.R.L. as soon as possible and I feel certain the people you have quoted will co-operate. No other course will finally settle the matter.

—A. Kisick, VK3KB.

DXCC

Editor "A.R.," Dear Sir,

Could I be permitted at this late stage to say a few words on the controversial subject of the countries list and DXCC. Whilst appreciating Alan Brown's opinion on the matter of the DXCC, I am afraid I must agree with Frank 2QL. The DXCC is not original, there should be only the one award of this nature in the world, as there should be a standardised list of countries. Maybe the present A.R.R.L. countries list is a little overdone, but I am sure that anyone with an ounce of common sense will agree that the two organisations should get together on the subject (if they have not already done so) and thrash the matter out. It could be done if both parties were willing to listen to reason and give and take a little.

On the subject of the Australian DXCC, I would suggest that it be scrapped without further ado, and a purely Australian award, covering the working of all States, with a set number of contacts for each State according to size be issued. In this way we would be doing something original and leaving the DXCC where it came from. I would suggest also that in conjunction with such an award, a similar one for s.w.l.'s throughout the world be issued.

For the benefit of s.w.l.'s who may be new to this hobby of ours, the listeners' equivalent of the DXCC is issued by the I.S.W.L. to their members only.

—Don Grantley, BERS1002.

HELP WANTED

Appeals have poured in from many countries for copies of the October 1958 issue of "A.R." This issue is out of print. Therefore we appeal to all Transmitting Amateurs, non-active members, and short wave listeners to forward any copies which can be spared to the Editor. Their action in so doing would help our overseas friends and would be greatly appreciated.

50 Mc. W.A.S.

Editor "A.R.," Dear Sir,

I support the opinion of Bill Rusby that, with the continued absence of a 6 metre operator in the Northern Territory, the 50 Mc. W.A.S. must remain impossible to acquire.

It was my misfortune to attend a Sydney v.h.f. meeting three years ago when this matter was discussed. I recall that the floor was firmly held by veteran 20 metre operators, possessors of an abundance of DX QSL cards and certificates who declared that: (a) There were too many VK awards, (b) That any misguided person who sought the 50 Mc. W.A.S. should not be given an easy task, (c) Antarctica should be substituted for N.T. with Fiji thrown in for good measure.

The real 6 metre operators sat quietly and listened, preferring to preserve thier vocal cords for use on the band, and quietly resolving to attend the next W.I.A. social convention where those who have travelled the longest distance or the shortest distance, or any distance must receive an award.

Is it morally wrong that, in particular, the newcomer, who has put hours of endeavour into building gear, listening and calling should seek a certificate in return for his efforts and which is denied him on account of official ineptitude.

In reply to a letter to Melbourne regarding W.I.A. Certificates, I was asked if I would care to submit a design for a new one? Must one be a fisherman to be allowed to eat fish? If we, in our hundreds, are lacking artistic ability, let us consult the imaginative t.v. advertisers!

The position in other countries is clear. The attainable W.A.D.N.Z. requires four QSL cards or letters of confirmation, and if neither is forthcoming, N.Z.A.R.T. has informed me that they will help in obtaining them. Also W.A.J.A.D. is equally possible. Perhaps some ZL and JA operators would like to acquire the 50 Mc. W.A.S. How?

If this award is really defunct, then, by all means, let us inscribe those names on a marble slab and deposit it in the appropriate place.

—H. A. F. Hoile, VK3HE.

Editor "A.R.," Dear Sir,

I fully agree with the sentiments expressed by VK2ABR in the April issue of the magazine. It is most frustrating to work hard for a 50 Mc. W.A.S. and then find that the N.T. is not represented on the band.

One solution would be to exclude the Territory as a necessary State, but this makes things too easy. After all, if an award is easy to get it loses value and those who have the award were faced with the same difficulty for some time. They solved the problem by encouraging Amateurs in the area to come on 50 Mc. Can't we do the same, and the next best thing would be to organise a DXpedition (they appear to be fashionable now) and then at least some names could be added to that list of 17.

I feel that on no account should the award be changed another award is virtually made if this is done. Since the N.T. is still there, we should try and get some representation from there on 50 Mc.

I'm sure Mr. Rusby, when you finally do work that elusive VK8/N.T. you will appreciate that certificate much more than if you got one without N.T. now.

Have we any takers for a 50 Mc. operator in N.T. or for a DXpedition to Alice Springs or places north?

—David Rankin, VK3ZAQ.

40 METRE DX

Editor "A.R.," Dear Sir,

It is very gratifying to a short wave listener when he is able to tune in and jot down some choice DX in his log, but more so when those much sought after signals are to be heard emanating from the 40 metre portion of the spectrum. But such has been the case in the few weeks that I have focussed my attention (and receiver) on that band. I do not know if it is due to the publicity given to 40 metres recently, both here and in overseas magazines, but the results are there. So is the QRM, but with a bit of patience the good ones can be readily logged, also no doubt they could be worked by anybody willing enough to have a go. This applies also to the novice segment of 40 metres. I do a lot of novice logging, and eventually when I get cards back from the lads (many of them only 14 or so), there is more often than not a comment asking for, or begging a sked with a VK as they never hear one. Maybe they cannot read the few VKs I have heard calling them due to their crowded conditions, but whatever the cause I would ask any of the DX gang, if you have the time, spare a little of it for some of these eager kids, and who knows, you may even land that missing State or two.

Reverting again to general DX on 40 metres, I have heard some 25 countries plus all American call areas in recent weeks, and I am sure my friend BERS196 has heard double that amount. Which all goes to prove that the DX is there. As for local calls, there has been an outcry about the lack of activity, but although the band is slack during normal working hours, there are always those few who can get on the air and do. And in the evenings and at week-ends and holidays, when the average Amateur is freed of his daily toil, then I would venture to suggest that the band is more than comfortably occupied. It must be realised that, at this QTH I am in the firing line from the two largest States (as far as Amateur population is concerned) and of course get more stations than a Melbourne or Sydney listener would.

But admitting that many of our members operate on other bands, others are exclusively v.h.f., and others are tied up with administrative duties, where are the remainder of the 1,000 or so members of the VK2 Division alone? Surely if even another five per cent. of the VK2 Division occupied 40 metres to the straining point, then we may have some argument for retaining the band, which I for one consider is well worth retaining. The s.w.l.'s are doing their part to bring the band to the fore in the limited scope which we have, so how about some of the missing links coming into action and helping to hold the band if it is at all possible at this late date.

Don Grantley, BERS1002.

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MODIFICATIONS TO NO. 122 SET

It was intended to publish in this issue some Modifications to the No. 122 Set. At the last moment a few more details were obtained which necessitated further tests being carried out. If you have done any modifications to the No. 122 Set please forward details to the Editor so that they can be included in the list to be published in a forthcoming issue.

AMATEUR CALL SIGNS

FOR MONTH OF FEBRUARY, 1959

NEW CALL SIGNS

VK—

New South Wales

2ACA—P. C. Seaberg, 187a Beardy St., Armidale.
2ANY—M. W Beck, O.T.C., Bringelly.
2AOX—H. Cox, 380 Lugarno Pde., Lugarno.
2AQW—L. A. Wade, 6 Edgar St., Auburn.
2ATV K. R. Virtue, 31 Union St., Sth. Lismore.
2AUN J G. Moss, 22 Fitzpatrick Ave., Frenchs Forest.
2AWE—W R. A. Evans, 16a Bradley Ave., Bellevue Hill.
2AXR—A. Davis-Rice, 7 Raymond Rd., Neutral Bay.
2ZJH—W. J. Hart, 83 Muston St., Mosman.

Victoria

3EP—M. R. Robinson, 9 Springfield Rd., Box Hill.
3HN—W. H. Berry, 52 McNamara St., West Preston.
3NQ—G. E. Heinrichs, 69 Barnards St., Cheltenham.
3AUA—M. C. Carpenter, 741 Elgar Rd., Doncaster.
3ZDT—P. G. Thorne, 10 Dickinson St., Glenroy
3ZEL—J. W. Spicer, 413 Stephensons Rd., Mt. Waverley.
3ZHH—K. T. Hughes, 226 Albert St., Sebastopol, Ballarat.
3ZIM—J. F. McKenzie, R.M.D., Toolamba.

Queensland

4GP—D. A. Crowley, 145 Nudgee Rd., Doomben, Brisbane.
4HM—H. D. Marriage, Block 10, Nundubbera.
4ZCD—R. L. Bishop, 36 Minimine St., Stafford.

South Australia

5EB—A. Havyatt, Carey's Gully Rd., Stirling East.
5KT—R. A. Fletcher, 22 Holden Ave., Woodville West.
5ZDD—K. Bartusek, 16 Maitland St., Mitcham.
5ZDH -N. J. Pollard, Lot 11, Brian St., Teatree Gully.
5ZDJ—W. J. Harwood, 52 Davenport Ter., Wayville.

Western Australia

6DC—H. E. Cole, 80 McDonald St., Como.
6VF—West Australia V.h.f. Group (Inc.), 29 Central Rd., Kalamunda.

Tasmania

7XX—D. B. McKelvey, 46 Athleen Ave., Lenah Valley.

Antarctica

0AW—A. W. Sawert, Mawson.
0EM—E. L. Macklin, Mawson.
0VH—F. A Van Hulssen, Mawson.

CHANGES OF ADDRESS

VK—

New South Wales

2HT—H. A. Harris (Rev.), The Manse, 46 Queens Rd., Brighton.
2ID—F. T. Adams, 21a Caloola Rd., Wentworthville.
2QU—G. A. Waddock, 3 Wrights Rd., Lithgow
2TE—A. Boyd, Cr. Corowa and Aldunga Sts., Blacksmith.
2ALG—J. A. Ackerman, "Idlewild," 191a North Rocks Rd., North Rocks.
2ASI—J. J. Sullivan, 13 Brooks St., Newcastle.
2AXK—D. A. Kinsella, Christian Bros. College, The Boulevard, Lewisham.
2AYR (previously 2AXR)—D. Robinson, 5 William St., Narrandera.
2ZAD—B. Holland, The Vicarage, Railway St., Belungra.

Victoria

3AJ—R. G. House, 54 Railway Cres., Moorabbin.
3EG—G. D. P. Clarke, 53 Alwyn St., Mitcham.
3IN—J. I. Young, Lot 4, Sesame St., Mount Waverley
3KI—T P Kirby, 61 Station St., Lower Ferntree Gully.
3PE—R. R. Elkin, 200 Johnston St., Collingwood.
3UD—I. H. Denholm, 751 Thomas St., East Brighton.
3UW—R. B. Wallace, Sgts Quarters, 1 C.O.D., Bandiana.
3WI—W I.A. (Vic Div), Station: 478 Victoria Pde., East Melbourne; Postal: P.O. Box 36, East Melbourne.
3XZ—R. R. McGregor, 65 McDonald St., Mordialloc.
3ALO—A. L. Lowe, 4 McCracken Ave., Blackburn South.
3AOG—T V. Sawers, 88 Price St., Essendon.
3ZAF P. Furr, 106 Koroit St., Warrnambool.
3ZGA—L. A. Maschetti, 8 Wright St., Laverton.

Queensland

4EP—E. J. Parow (Rev.), Station: Spencer St., Gatton, Postal: C/o. P.O., Gatton.
4KA—K. A. Smith, 5 Lacon St., Holland Park, Brisbane.
4KC—W. Beck, Upper Gay Ter., Caloundra.
4OM—M. N. O'Burrill, 27 Humphrey St., West End, Townsville.
4SD—A H Sharland, Station: 44 Bolsover St., Rockhampton; Postal: C/o. D.C.A., Aerodrome, Rockhampton.
4XS—L. J Salter, "La Novia," Wengenville, via Kingaroy.
4ZBD—D. B. Hughes, 60 Mayne Rd., Bowen Hills, Brisbane.

South Australia

5FM—H. N Bowman, Mais Ter., Crystal Brook.
5FP—F C. Purcell, Main South Rd., Darlington.
5LJ—J. R. Lewis, 79 Henley Beach Rd., Mile [redacted]
5PO—A. M. Perriman, Flat 4, 361 South Rd., Black Forest.
5VV—D. Wilson, Station 5AU, Port Augusta.
5WA—C. J. Waterlander, 43 Victoria Rd., Bir[redacted]
5ZAF—D. G. Pfeiffer, 8 Hyde Ter., Tusmore.

Western Australia

6AJ—A. J Jeffrey, Flat 1, 18 Forrest St., South Perth.
6JE—C. R. Elsbury, Nornalup.
6JW—J. C. Watson, 118 Gugeri St., Claremont.
6SP—J. C. Watson, Station: Portable on board vessel "Silver Fin"; Postal 118 Gugeri St., Claremont.
6ZAA—W. J. Howse, Flat 5, 1196 Albany Highway, Bentley.
6ZBJ—B. J. Clarke, 210 Carr St., West Perth.

Territory of Papua and New Guinea

9DT—D. G. Taylor, Boboro Ave., Boroko, Port Moresby.
9HI—L. Raebel, Budoa Ave., Boroko, Port Moresby.

CANCELLED CALL SIGNS

VK—

New South Wales

2AW—A. W. Dye.
2IJ—D. A. Crowley.
2TI—H. J. Trick.
2AET—A. Havyatt.
2AOP—M R. Robinson.
2ATZ—I. Zainuddin.
2AWJ—K. J. C. Wordsworth.

Victoria

3XL—W. H. B. Sydserff.
3ATV—J. A. Hampel.

Queensland

4HO—M. S. Robinson.
4OB—J. P. Baker.
4OX—H. Cox.
4ZBN—N. Bignell.

South Australia

5PQ—P. Muscat.

Western Australia

6FC—F G. Clarke.
6ZAJ—B. W A. Jacobs.

Territory of Papua and New Guinea

9AH—A. J. Humphries.

Antarctica

0AA—W. J Stewart.
0AC—C. S. Nilsson.
0AS—A. H Sandilands.
0AT—E. S. Trigwell.
0BG—B. C. Cook.
0DA—D. A. Brown.
0DC—D. R. L. Callow.
0HK—H. Knox.
0IJ—D. R. Twigg.
0KC—P. K. Chapman.
0PC P E. Clemence.
0PK—P. King
0PT P. B. Turner.
0RB—R. A Borland.
0RO—R E. T Oldfield.
0RR—R. R. Arnel.
0TC—T. J Cordwell.
0ZN—B. E. Shaw.

PERMITS GRANTED FOR TELEVISION EXPERIMENTS

VK—

New South Wales

2AVQ/T—R. R. McKew, 19 McKeon St., Maroubra Beach.

[redacted]

3ATJ/T J. W. Walters, 221 Prospect Hill Rd., Surrey Hills.
3ZIE/T—D. L. Seedsman, 49 Cookson St., Camberwell.

Queensland

4GT/T—W. G. Heaton, 8 Gibbon St., East Ipswich.

PREDICTION CHART, MAY 1959

John C. Pinnell, VK2ZB
15 Summit Avenue,
Earlwood, N.S.W

The beginner launching out into the "DX field" will sooner or later discover that he must have some kind of filing system. Get one going before you work too many stations and so avoid a lot of confusion later. It is important to keep a record, for quick reference, of all contacts, names of operators, if you have met before, sent or received a QSL card; etc. A filing system is the answer. Each operator has his own "pet scheme", some good, and others not so good, while others depend upon their memory.

Depending on memory did not work in my case so I set up a filing system which is a bit elaborate but very effective. This is how it operates—a card is used for each different station worked—the call sign is placed on top then followed by the name and address. Each contact is entered with date, QSO No. and frequency on one line. A cross on the top left-hand corner indicates a QSL card has been sent and one received. The QSO No. gives quick reference to the log book records. Each card is 1⅞ x 3½ inches, cut from drawing paper. My file of 12,000 cards fit into a drawer 18 x 18 inches. It takes less than ten seconds to get the information of all contacts with any station worked since 1929. How nice it is to call a fellow by his name even if it has been 20 or more years since the previous QSO.

Reports this month indicate much improvement on the 21 and 28 Mc. bands. At times signals were very good. The 28 Mc. band opens for Europe and Mediterranean area around 2000z and lasts for at least a couple of hours. 21 Mc. is fair over several periods of the day; best times appear to be 0500-0800z, 1000-1300z, and again at 1900-2300z. Although there was some improvement in conditions as far as the 14 Mc. band was concerned, reports indicate considerable "patchiness", some evenings stations came through very well, yet on other evenings there was almost a complete "black-out". These conditions were very noticeable with the Europeans. It is hoped the band will be better as the season advances. Again, many good DX signals have been reported on the 7 Mc. band, especially from Europe.

"Slow Handclaps" to the VK3 who sat right in the middle of the c.w. band with broad tone during the second week-end of the A.R.R.L. C.W. Contest. You effectively prevented many contacts for VK and ZL OM.

The DXpedition to Serrana Bank, an uninhabited shoal which has been given separate country status for A.R.R.L. DXCC, took place in March for approximately five days, but was delayed in getting on the air by the party's inability for two days to find the spot. They ran short of fuel and decided to return to San Andre (HK0) to refuel. Worse was to come as they could not locate San Andre and had to call at Corn Island to get sufficient fuel to reach San Andre. They eventually got on the air as KS4BB for A.R.R.L. C.W. Contest when they normally would have had the trip over. If you worked them, QSLs go via W4KVX or W9JUV

ZL3DX, who made the very successful Chatham Island trip recently (ZL3DA), plans another round trip to include British Samoa operating as ZM6AC on May 14, 15 and 16, Friendly Islands operating as VR5AC from May 19 to 25; Niue Island operating as ZK1AC on May 26 only; again British Samoa operating as ZM6AC from May 28 to 30. VR5 has had no Amateur Radio activity for many years. Evidently 20 metres will be the most used band as he is taking a 2-element 20 mx beam. He will also use s.s.b. at each location.

SU1KB, Mohamed Rashed, says there are five Amateurs in Egypt, all in Cairo. They have great difficulty in getting parts for their equipment, so find it hard to keep on the air (W0AJU)

Someone is having a great time at the expense of ZD7SA for he is receiving lots of QSLs for s.s.b. and he has never been on s.s.b. (W2ZGB)

---

* Call signs and prefixes worked.
z zero time—GMT.

Guatemala has a new prefix, TG5. There is only one active station whose call sign is, I believe, TG5SRO. He was YN4CB until a few weeks ago before he moved in from Nicaragua.

A rare one is **PJ2MB**, he came on the air from Sint Maarten a few weeks ago on 14 Mc.

Ex-VS2DQ is now **9M2DQ** and is the only station on Langkawi Island, off the coast of Malaya. It does not count as a separate country from Malaya.

HV1CN is the only licensed station in Vatican City. All other HV stations are phonies. He has been unable to get any of the cards sent via the A.R.I. If you are entitled to a card send an addressed envelope and postage, also QSO information.

VP2AB has just received his ticket and should be on the air anytime now from Antigua.

VK9XM and **VK9XN** are the only stations active from Christmas Island.

VR1B is active on all bands from 3.5 to 28 Mc His signals are very strong in Sydney. VK2QL reports working him on three bands—14, 21 and 28 Mc. Chas. is ex-VK1AC and VK0AB

Nepal.—The Cook Laboratories in U.S.A. is under contract to supply and instal electronic equipment in Nepal soon. It is being considered to include a Ham in the party to go to this rare spot.

VK4XJ reports working JAs almost every night on 50 Mc. He also worked **KH6UK**.

ACTIVITIES

28 Mc. C.w.—4XJ: OH6RE. 4DO: Ws*, JAs*, KH6s*, DU7SV* L2022: Ws, Js, VR2DA, UA-6KOB, SP4JF, SM7MS, G3DQ, CN8JE, G2YK, OK1KKQ.

28 Mc. Phone.—4XJ: VR2BC*, XE1OM*, HC-1KV*, CR7LU*, ZD6DT*, ZE2KL*, SM3CO*, DJ3CN*. ZS6AST*, HC1KV*, VS1JT*, KAs*, VRs*, lots Ws*, ZS6WS*, Gs, XE2JE, VP1EE, 4DO KAs*, Ws*. L2022 KR6HI, G3CAS, ZS-6AJX, Ws.

21 Mc. C w —2QL: CN2BK*, ZB2I*, SV0WAE*, ZD2GUP*, ET2VB, YN1WW, MP4KAS. 2ZK: EA9AQ*, DJ3FE*, 4ND*, DL3BJ*, 6ZZ*, F1DM*, DT, G2CKK*, 2GM*, GPD*, 3ASG*, JQX*, MIX*, JOC*, DQO*, MLX*, GW3AQV*, G4NL*, 6GM*, ZG*, 8PD*, ON4NI*, LA5MG*, SP7HX*, VR1B* 4DO Ws*, Ks*, PJ2s, KM6BJ, SP1KAA, 4X4DR.

21 Mc. Phone.—L3065: ZLs, Ws, CN8IT, JE, 9CJ, F8JJ, LE, FK8AU, CT1PK, DL4AT, G3JAF, GC3CGK, KH6s, VRs, VS1HU, VE7EH, KR6H1, KG6GH, KA0IJ, XE1DT, LA7RF/MM, KL7FAK, HL9KS, YV5AEC, JA4HN. 5AB: KB6BH*,, s.s.b. phone: KH6BP*.

14 Mc. C.w.—2OW: KC6JC*, VP9DO*, UA-4KHC*, 0CN*, OA4FA*, BV1A*, BV1USB*, XZ2TH*, VS9MA*, ZS6R*, ZK1AK*, UR2BU*, 4X4CK*, 4X4HK*, KV4BO*, ZS6AMC*, ZS6R*, VS5JA*, ZC4IP*, VK0CC*, 1T1TAI*. 2QL: SM-5WN/LA/P*, XW8AI*, OQ5IC*, CR7BN*, KS-4BB*. VS9AC*, LA2JE/P, 5A5TO, 5A3TQ. 3ZK: DJ2DL*. DL4MG* DM2ANN* OE5MM*, ON-4AU*, OH8NC*, OK3MH*, OZ9AO*, G3MAN*, SP9RB*, LA3Q*, UA3CK*, UA1KAE/6*, YO-1DX*, KR6RP*, KB6TM*, F8VQ*, 11BAY*, LU-4DM*, PY1DG*. 2AMB VR1B*, KS4BB*, LU-5ABL*, YN1AA*, VP8EP*, KP4AR*, LA3Q*, EA8CG*, FB8BX*, ET2VB, VP4TR, KG1BO, XZ2AD, 9M2MA, FM7WP, VQ2AB CR9AM, VP9EN, VS5JA, VS5AD KW0CU CR9AI, FO-8AU 4DO Ws*, VEs*, KH6s*, KAs*, DL1UZ*, DM2RVN* DL1EM*, DJ2KS*, F8QD*, G3BKF*, HB9VW*, HB9YL*, 11CTS*, FU8AE*, HB1VL*, JZ0DA*, LZ1KSZ*, LA4DD*, LA8CE*, OH2QQ*, OH2LX*, ON4UT*, OQ5BC, PY2EU, OH2LX, OH2HX, OH1QE, OH1PW, LU3HBZ*, SM5BVF*, SM3BTU*, SM2DR*, SP8HU*, SP8GB*, SP9DT*, VP9EB*, VK9AD*, XW8AI*, EA8CG*, ZE8JP*, ZE7JF*, UA3GC*, UA0KCK*, UA0FF*, FF8BX, FF8CC, HA5BD, HA5FR, HA8KA, CR4AX, CR5AR, FQ8HF UB5KEF UO5PK, UO5KAA, UP2KCB, YO0RI, YU3AB, YU3EL, YU6CA, 4X4CT, 4X4HK, 4X4IR, 4X4JL. BERS195: BV-1US, CE8AA, DU1DR, EA8CG, ET2VB, FA4HM, FF8BZ, HC4IE, JZ0DA, K6TSQ/KG6, KM6BL, KX6CO, OQ5BC, OR4RW, SV0WC, TI2PZ, UD-6KAK, UL7KAA, VK0CC, VQ8CF, VQ4KRL, VQ6AB, VQ8AQ. XW8AI, ZC4PN, ZE7JF, ZS5VJ, 4S7FJ L2022 UB5SE, OQ5IC, PY6AC, GW5TW, 5A3TQ. VP9EP, GW3LEF, TI2WD, ET2KY, LZ1AF, OX3RH, YV5AO, UO5PK, UO-5KAA.

14 Mc. Phone—2AMB W4JRD/KS4*, YS1MS*, MP4BCC*, FO8AX, YS1WW 3AOM* DL1DX*, F9NW*, KA2CB*, OA4FP*, UR2BU*, VE1EI*, VE1HY*, VE1NK*, VE5VL*, VE7JB*, XE1BBA*, XE1CW*, XE1DE* 4DO VK2FR/LH*, VK9AD*, Ws*, VE*s, OH4NC*, FM7WN* 5AB: ET2US*, HH2HH*, HB9ET*, HL9KR*, Gs*, 11EZZ/M1*, JA1MO*, KSDKZ/VO1*, KX6CN*, KA6IM*, KS4BB*, KG1AA*, GI3CWY*, MP4BBW*, PJ-2AN*, PY2CK*, OA5H*, OK1MG*, PA0DV*, SV0L*, SV1AB*, TI2IO*, UA1BE*, UP2AR*, VQ8AL*, VS1HT*, VS4JT*, VU2RX*, XZ2AD*, YV5FK*, 5A2TK*, on s.s.b. KG6FAE*, K8LYK/KM6*, KM6BI*, KC4USM*, LU3EQ*, ON4DM*, VP2GDW*, VS6HZ*, VP2LW*, VQ1ERR*, FO-8DZ*, XZ2SY*, 9G1BQ* L2022 OZ1PS, HZ-1AK SM4AK L3065 Lots of Ws KH6CUQ, KB6BH, KM6BL, KW6CJ, VK0CC, EA3JE, KJ-6BV, VK9AS, WA8DFH/MM, KA5MC, KA2DO, VE5YL, KX6CQ, KX5BU, I1ADX, TI2AB, KA-0IT, KR6RO, KR6IT, ZLs.

7 Mc. C.W.—2AMB LA4FM, 2QL. JA3BBX*, JA1ZF*, KG1AR*, KS4BB*, CN8JE 0800z. L2022: Ws, UA0KIA, KH6LG, KL7SFN, JA-2AAQ, UA0KSA, JA1VX, KH6BXE, ZS5FH, VQ4VQ, UB5FP, many Ws. BERS195. G2RF, 11BAY, JAs, KAs, KL7APD, OK3AL, PY7JL, SL3AG, SP6KBE, UA1KGC, UA9KCC, UB5KBB, UC2KAB, DM2XLO, UO5KAA, UQ2AB, UR-2KCA, UL7JA, VE7AOU, XE1UU, VR2CC, YU-2ARS, ZC4AM, ZE8JJ, ZS6ASX, UA0LS/MM L2022 UA6LI, OH5FJ, DL7GX, DJ2ZQ. 3AKN: Ws, HA4YB, Gs, YO3OS, YO4BA, UB5KO, VU-2ND, ZS1TU, ZS5AT, ZS6AVO. 5JE: W* (77), VE*, KH*, KL*, UL7JA*. OA4FM* (all in the evening), ZS4KJ*, ZS6APS*, ZS6AUP, DU1NZ (around 2100z), OA3DR, YU2ARS, GW3NDB, OH2HK, UB6FB, SM6YF/MM (English Channel).

QSLs RECEIVED

2AMB FA3QY, HC4IM, JT1AA, LX1DE, TY1HQ, UQ2AB, VP8BJ, XZ2TH, YU3RM, ZD2GUP. 2OW: KH6MG/ZK1, ZK1AK, FP8AR, HA5BW, HA5DU, KC4USN, UH8KAA, ZE7JY (Marjorie). 2QL: CR7BN, CT2AI CX3BH, UO-5AA. 3ZR ZP5CF, VP8EP, 4X4WF and 43 Europeans. 3AOM HL9KS, HL9KT, JZ0HA, XE2TM. 5WP GI3IVJ, HP1CC, UA6KOD, UA9OI, UR2BU BERS195, FR7ZC, HC4IM, HB1UE/HE, KP4VUH, UA3XZ, UA0IA, UD6AM, VQ4FM, ZE4JZ, ZS4LB, 4X4WF

QSLs for ZD2GUP and VS9AC should be sent via R.S.G.B. 2QL).

ZL1ABZ QSLs for Kermadec Island contacts have been distributed to the U.S. Amateurs. It is not known if any have been issued to VKs due to the ban that was placed on VK cards by the W.I.A.'s. refusal to accept ZL1ABZ cards even for the 3.5 Mc. contacts made 2QL).

VK6AB is handling VK9AD cards and all QSLs may be sent to him direct at Box 1, Hynam, South Australia, or via VK5 Bureau. They will be answered in the usual way.

It appears that all DX phone men are worried about the idea of losing the top 50 Kc. of the 14 Mc. band to the Ws. 5AB suggests everybody write their protest to the A.R.R.L. individually.

Much of the news in these notes was supplied by **W4KVX** DX Magazine via 2QL. 2AMB, thanks Laurie for telephone call and help given. 2QL has been a power of help again this month. 2OW notes much appreciated. 3AKN, welcome to the DX page Don, we all had to make a start and it should not be too long before you add new countries to your list. 3AOM never misses to supply some interesting items. 4XJ has given the 28 Mc. notes a boost this month. Sorry your notes were one day too late last month. 4DO: thanks Nai for that very impressive list. 5AB, Brian has given a couple of interesting points which are included in the notes elsewhere. 5WP, thanks again for your letter. BERS195, thanks for your words of appreciation and good wishes, Eric. L2022, your long letter is very interesting Don and I will be using some of your points in a future DX page. L3065 is doing well on 15 Mc. and heard 23 countries during the month, hope you will find time to send some notes now you are back to study again.

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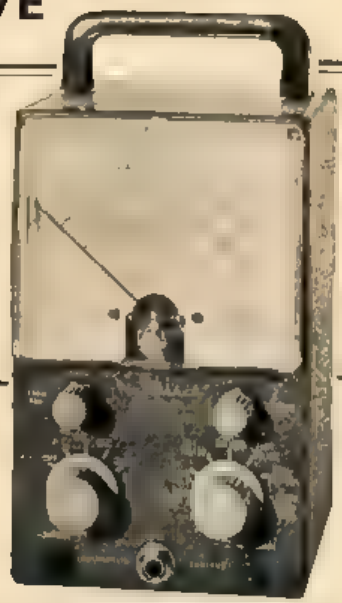

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V H F

Frank P. O'Dwyer, VK3OF
190 Thomas Street,
Hampton, Vic.

A mixed bag this month with the emphasis on a high level of activity for those in the north and reasonable to indifferent results for those in the south. The story unfolds in the Divisional notes; the highlights from VK4 being daily openings to JA and KH6, the first W contact this year and the swamping of KR6AK and VS6CJ by the JA QRM. The ZLs are still through to W land. It would pay dividends to watch 51 Mc., the chance could be there to work them either by BS or possibly direct. Down south, in VK3, the JAs had a frustrating habit of popping in and out so the bandwatchers had to be sharp off the mark to secure a contact. At times JAs were heard calling all Divisions, indicating that openings were general over VK, though on a sliding scale of effectiveness from north to south. Though VK7 were heard being called, no news has come through of any contacts.

A run through of VK2 activity gives us on March 1, 2ZAC hearing JA1 at 1300, while from 2315 2HE beaming north east heard two Spanish speaking stations on 50.24 and 50.29 Mc., the first being R5, S8-7. March 6, Bill 2ABR worked JA1 and 0, 1230 and 1300; March 8 2ZAC and 3JX worked JA3, while at the same time 2HE made use of Es to contact VK4ZBE. The 12th found 2ABR QSO JA1 and 3, 1400 and 1510. The 19th, a world day, next came up with weak JA8 and other carriers at 1320 for no contacts. The 28th proved the best day of the month when VKs 2HE, 2ABR, 2ZCF and 2ZDE successfully competed with VK3, 5 and 6 between 1100 and noon for contacts with JA8. At 1250 a JA t.v. signal came up on 48 Mc. The video carrier was so strong Dick 2ZCF tried for a picture but failed because of a poor antenna. Last in for the month was JA1IGY on 50.9, the morning of the 31st, heard by Bill 2ZAC.

ROSS HULL CONTEST RULES

Food for thought. An extract from a VK3 letter "It is a tragedy that VK7 is now F.C.C. with the possibility of other bands besides 50 Mc. being used for the R.H.C. to the advantage of VK5, 3, 7 and southern VK2. If I went to Griffiths, southern N.S.W., I could work VK3 and possibly VK5 almost daily on 2 and 6 mx. Best that they make the R.H.C. a handicap affair, the handicap being that ACE HIGH scorers of the past, 4NG, 4BT, 3ZER, 5QR, 6BO, etc., be forced to operate from this non-resonant bowl called Sydney. They would then realise how frustrating 50 Mc. listening can really become."

The implied plea is that the rules be based on a National, not a parochial viewpoint. The F.C.C., handling all contests run by the W.I.A., has this problem-child, the R.H.C., to cope with. The resolving of the rules to satisfy all Divisions calls for wisdom of a very high order and a complete divorcement from pressure groups and local outlook plus the co-operation of all interested in the contest in that their views should be submitted for examination. Official views of the V.h.f. Group in each Division and also the views of each member. Group meetings as such cannot be attended by all those who participate in the contest, family and business life may enforce absence from meetings for the city fellow, while the country man has no say at all. The characteristics of 50 Mc. are entirely different from those of any other band, 144 Mc. included. For that reason alone, those members chosen for F.C.C. will need to examine closely and become fully informed about 50 Mc. and 144 Mc. activity, usage, and the opportunity for each member to participate on an equal footing in the contest before they re-examine or revise the rules.

TECHNICAL INFORMATION

T.V.I. Severe cross hatching on Channel 2 from 144 Mc. tx. Cause, stable r.f. on t.v. station's freq., no overloading, which would be indicated by blackout. Same may be caused by tx on other Amateur freqs. In use, a 5763 tritet osc. Cure: a 0.01 uF disc ceramic across the heater pins 4 and 5. Not effective if from one heater pin to a ground point some distance away. Cause of trouble, 5th harmonic from 8 Mc xtal being radiated from the heater wiring. In general, all power leads must be shielded and filtered. A point worth stressing. Like any other rec., a t.v. set can handle only so much signal without overloading despite the normal a.g.c. used. With this maximum amount of signal present to a t.v. rec., it is still possible to cause cross hatching with an r.f. signal on the same freq. as the t.v. station. A g.d.o. does not generate much power (usually), but try the effect of one set up on the vision freq. of a t.v. set 100 yards away. Thus because a station is located in a high signal area he is not automatically exempt from t.v.i. problems. (3ZAQ)

T.v.i., V.h.f. Converters, and Reverse Action.—Adrian 2HE was plagued by Channel 2 getting into his 50 Mc. rx and blotting out all signals. The trouble was due to the use of a harmonic osc. in his converter. Cured by changing the osc. over to the Robert Dollar overtone circuit. David 3ZAQ found it necessary to watch the choice of freq. in his xtal locked converter for 144 Mc. His 6J6 multiplier (21 to 63 Mc.) generated enough r.f. to cause cross hatching on a set 20 yards away. Trouble rectified by making the 6J6 double to 42 Mc., then tripling to 126 Mc.

RF25B Converter Modifications. Replace the 2.7K shunt feed resistor to the r.f. anode with an r.f. choke. Output improves enormously. Add an external cathode follower for best results. 6C4, 2.2K to 10K in the cathode, anode by passed, 1K de-coupler to B plus, 0.001 uF, output capacitor from cathode. Grid leak 100K to 470K, input coupling 100 pF. The l.f. coil feeds directly into the output, without a cathode follower the input impedance of the main rx damps things horribly. Converter covers from 43-70 Mc., about 500 Kc. fully sensitive on each of the five bands. Band 5 is the highest frequency. (3ZDG).

Valves 4CX6 This is a video output pentode which is excellent as a crystal osc.-multiplier, or multiplier. Can be used in place of a 6CL6 or 6AG7, same values, different socket. Short by-pass leads, direct to cathode pin, otherwise parasitics due to high gm. It is cheap. **ECC189:** A new double triode for cascode service. Gm 12.5 mA./V., base as 6BQ7, price about 30/-, limited supplies available. (3ZDG).

NEW SOUTH WALES

Meeting, 6/3/59.—A good attendance to this meeting heard three lecturettes, firstly, by Keith 2ZJK on a transistorised voltmeter, Bob 2ASZ described the conversion of a 522 to 50 Mc. operation, and 2AWZ discussed a transistorised field strength meter. The lecturettes were practical and interesting and gear was displayed by each speaker.

DX Trophy.—A proposal by the committee for an annual 2 mx DX award was approved by the meeting and was ratified in a subsequent committee meeting. The contest is now named "The VHF DX Trophy" and is to be awarded to the N.S.W. member or members of the W.I.A. who establish 2 mx communication over the greatest distance during the period of from 1st April and concluding 31st March the following year. The trophy shall be awarded for a period of 12 months together with a suitable miniature to be retained permanently. In the event of two N.S.W. members qualifying, the trophy shall be held by each for six months and each shall receive a miniature. Claims in respect to the contest should be forwarded to the N.S.W. V.h.f. Group Contest Manager. So there it is chaps, go to it and best of DX.

Coming Events: The May lecture is anticipated to be on 560 meg. gear and the usual day and evening events will be determined by the new committee.

2 Metre Activity.—Contacts over the 100 mile path to Newcastle have become more frequent and 2ZDF and 2DL are worked consistently. Also 2ZDC at Wyong has a good signal in Sydney. We welcome to the band Tim 2ZTM who came on the air very smartly after receiving his call. Bob 2QZ is back after a quick trip to India. 2ZFC now has a good mobile sig. with a 3/12 in the final. Reports in to the 2 mx v.h.f. broadcasts at 7.30 p.m. Sunday evenings have been good, with up to 12 stations reporting.

6 Metres.—On Saturday of the Easter weekend 28/3/59 the band opened to JAs and amongst those who participated were 2HE, 2ABR, 2ZCF and 2ZDF, each of whom would agree that this was as good an Easter present as anything else; congrats. lads. Barry 2ZAG has fired up on this band with a very big signal from a 6146. Local activity has also increased on 50 Mc.

Right, chaps, well that is about all this month and next month these notes will come via a new scribe as will the direction of the Group be determined by the new committee. Each of us on the committee have enjoyed our job and trust to have made some small contribution to the benefit of the Group.—3AWZ.

VICTORIA

5kcds.—288 Mc.: 3ZCN (Ballarat) to Melbourne from 2000 each night Monday to Friday. Watch 144 Mc. around this time for the liaison set-ups. Freq. 290 Mc., 288.15 Mc. approx. **144 Mc.** 2AJO at Coolamon (near Wagga) on 144.31 Mc. Friday nights only 2030 hours. He transmits 2030, 2035, then listens. **50 Mc.:** I am going to try and prepare a list of overseas "beacon" transmission times, and publish them next month.

50 Mc. DX 1st March saw 3XD hearing two unidentified Ws at 0845 rag chewing. 18th March 3ZBN heard W6BSR or BSX at 0615. 28th March, JA8 stations worked at good strength in Melbourne from 1020-1215. 30th March, 3CI worked JAs during the afternoon, HL1KA was audible off and on from 1100 to 1500, and other signals were heard. 31st March, HL1KA audible 1500-1505 (report from 3AZY).

3XD has his beam up over 70 ft., and looks like being one of the "big noises". He is willing to send c.w., so don't forget him if you want a few minutes practice (hope you don't mind me saying this, Dick). 3ALZ is disposing of all his gear, except for six, and is pursuing his studies at the University, best of luck, Ian.

144 Mc.: 3ZCW at Ouyen has been worked (in Ballarat, at least) most nights, and the reliability of contact seems very good. Activity is pretty poor, and you can't blame six, because very few of the old 3 mx gang seem to work on 6. Its probably that the old hands have tired of it, and the new blood has gone to six—if this is the case, there'll be renewed interest in two, when the new stations become established and go looking for fresh fields of endeavour.

Ballarat news. George 3ZEA has put in quite a good signal on a number of occasions. Hugh 3BC was worked on Mar. 5 and 9, his sigs. peaking S8. Mar. 12, Peter 7PF was also worked. The sked with Ron 3ZER at Alexandra produced no results. Ron is now portable near Ararat until further notice. Gordon 3AGV at Colac has his new final in operation and has made his already paralysing signal in this area even more so. Stuart, the voice in the background at 3ZQG, has passed his A.O.C.P. and is building gear. Stuart will operate from Avoca. Several of the d.c. boys at Rainbow are now interested in 144 Mc. and should shortly be on the air. Ray 3ATN, Birchip, is getting the v.h.f. bug again and plans to put up an umpteen element phased array for 144. 3AKR, Westmere, is planning on coming back on the air again.

288 Mc.: The Melbourne-Ballarat skeds seem to have temporarily lapsed since 3ZCN went on his holidays, but never fear, they'll start again as soon as we can catch Les! The following stations are crystal controlled on 288 Mc.: 3ZDG, 3ZAT, 3ZDO, 3QO, 3ZBP, 3ZAI, 3AUX, 3AAK, 3ZER. 3ZBP and 3ZAI have perfectly respectable v.f.o's.! Ron 3ZER seems to have deserted us, as the word is that he is installing 6-8 mx in his shiny station wagon—but something had to go.—3ZDG.

QUEENSLAND

Another month of hectic activity in these northern parts which should make the other States envious. Last contacted KR6AK on Mar. 1, but both he and VS6CJ have been heard almost nightly under the mighty JA QRM. 4ZBE finally achieved the One-Day AJD award issued by the Himagi Radio Club to any station able to contact all JA districts in one day. Believe he is the first station to do this.

March 7 brought the good DX back with the appearance of KH6s HCF, CTC, UK. Over the last month nearly every active VK4 has heard and worked them. KH6UK is the more consistent with his automatic c.w. and 700w to a pair of 813s. They have been in almost daily and 4ZBE has had over 30 QSOs with them, many of the locals reporting likewise. At times the band has been open to KH6 from VK8XK up north to 4ZAX, 4ZGL and 4ZAA in the south. The KH6 gang do bemoan the fact that they can neither hear nor work VK2, 3 or other Divisions. Strange the Inverell gang cannot hear them, they have some rock crushing signals up here. Beaming on KH6 a pulse station with occasional a.m. is heard on 49.85 Mc., using the call signs 5KR and 5WR. Any information about these stations would be most welcome. A tape recording of the transmissions has been made, anyone interested can hear it by dropping 4ZBE a line. March 18, listened to a K0 in contact with a W0 for one over, but nothing further. Bob 4NG has heard a KL7.

Here at last is enough information on that raw carrier on 49.8 to settle all arguments. The carrier is that of DU1GY, used for research on Back Scatter transmission and reception. His power rating is 5kw. The JAs monitor this for openings to DU. They say when DU-

(Continued on Page 20)

I.T.U. FUND DONATIONS

The Fund to raise money to send a W.I.A. delegate to Geneva later this year representing the Radio Amateurs of Australia is still open for subscriptions. Our original objective of £2,500 has not yet been reached, so that extra efforts are called for by individual Divisions and Radio Amateurs alike. Further efforts by way of official broadcasts, fund raising schemes by disposal of gear, etc., in Divisions and individual approaches to those who have yet to subscribe will all help—every little helps no matter how small. Many have already subscribed two and three times. If YOU are as yet a non-subscriber do not leave it to your fellow Amateur to subscribe for you—subscribe yourself—the small amount requested is little enough to pay for the benefits that can accrue from our delegate's presence at the I.T.U.

Send your donations preferably direct to:—
The Federal Secretary,
Wireless Institute of Australia
Box 2611W, G.P.O.,
Melbourne, C.1, Vic.

Cheques, money orders and postal notes should be made payable to the "Wireless Institute of Australia (I.T.U. Fund)".

A further list of subscribers to the end of March are as below:—

£27/1/0:
N.S.W. Division, VK2WI (Disposals sale).

£25/0/0:
Hong Kong Amateur Radio Transmitting Society.

£16/11/0:
E. L. Andrews, VK2BO.

£10/18/0:
S.A. Division, VK5WI (Disposals sale).

£5/5/0:
H. J. Taylor, VK7TC; Radio Society of W.A., VK6SR.

£5/0/0:
F. Clissold, VK2AJI; H. R. Carter, VK2HC; R. W. G. Wehr, VK5ZAX.

£3/3/0:
S. W. Grimmett, VK2ZW; L. L. Brennan, VK2AMU; I. Archibald, VK2KU.

£3/0/0:
Blue Mountains Radio Club.

£2/10/0:
Dr. R. L. Douglas, VK2ON; F. R. Whitfield, VK6XF.

£2/2/0.
O. G. Hall, VK2AGH; F. M. Orvad, VK2AHX; H. P. Jackson, VK2AHZ; W. O. Yates, VK2AWY; W. L. Nye, VK2XU; H. Chapman, VK3GU; J. L. Lewis, VK3HW; W. H. Ross, VK3UT; G. W. Haughton, VK4LW

£2/0/0:
G. L. Barthold, VK3BT; G. Wilde, VK5GX. K. L. John, VK5WL; J. Douglas, W1A-L2013.

£1/10/0:
R. H. Rayner, VK2DO, L. Carpenter, VK2ZCC, L. Abraham-Wilms, VK3AB, J. W. Battys, VK5JB; J. Allan, ex-VK3EI; I. D. Stockton, VK2AAJ (£1/8/0).

£1/5/0:
C. Thornthwaite, VK2AZO; T. M. S. Spence, VK2JS.

£1/1/0:
W. E. Mill, VK2AHV; Dr. J. K. Fullagar, VK2AJY, L. M. Wilson, VK2ALM; H. Ruckhert, VK2AOU, T. W. Stewart, VK2AOV; T. Barlow, VK2GQ K. G. Scott, VK2XS, C. J. Charman, VK2ZCJ, S. J. Beaton, VK3ZE, V. S. Thomas, VK3PT; I. Morrison, VK4MO; L. Raebel, VK9HI; R. Hooper, VK9RR.

£1/0/0:
M. C. Laybutt, VK1ML.
J. Howard, VK2AMH, H. Nottingham, VK2HN, K. Matthews, VK2WE; S. Glyde, VK2GC; W. Zech, VK2ACP, P. Pearson, VK2ACQ; C. Wilkins, VK2ALB, E. Olds, VK2BY, E. Kinscher, VK2ADL; C. Malouf, VK2AMA, H. Booth, VK2AMD, R. Overton, VK2ARO, A. Bowman, VK2ASB, J. Reed, VK2JR, H. Capsey, VK2OQ, J. Howie, VK2AYH, N. Beard, VK2ALJ, V. Fitton, VK2SF, M. Sobels, VK2OT; J. Kearines, VK2AKC, J. Virtue, VK2GJ, L. Woolnough, VK2GW, L. Baber, VK2RJ, W. Stitt, VK2WH, J. Meagher, VK2AMV; K. Mitchelhill, VK2ANU; R. Godsall, VK2AEG; A. Hore, VK2ZCH; W. McInerney, N. F. Black, K. C. Matter, R. H. Mondel, J. E. Shrubb, J. G. Challenger, N. J. Finch (N.S.W.).
L. Laughton, VK3APL; L. White, VK3ZEW, K. Maroney, VK3IR, A. Miller, VK3AH; J. Cations, VK3ALP; A. Lowe, VK3ALO; I. Thomas, R. Davey (Vic.)
O. Nattrass, VK4NO, R. Collins, VK4KK; A. Taylor, VK4BE; S. Armstrong, VK4SA; T. Barber, VK4ZBH, L. Murray, VK4ZBL; W. Van Der Est VK4Z——; A. Boekholt, VK4LB.
R. Champness VK5ZCD, A. Mutton, VK5ZY; R. Fawkes, VK5FK, J. Porter, VK5PM, A. Drew, VK5LN, K. McLeod, VK5MT; E. White, VK5OW, R. Martin, VK5TM, B. K. Hajniak (S.A.)
K. Cook, VK6CA; F. Brown, VK6FB, F. Beadle, VK6FW; W. Redden, VK6ZAX; I. Clinch, VK6CL.
A. Nutt, VK9ZAN.

Under £1/0/0:
Es Ashley, VK2ASE (10/-); L. McGarrigle, VK2YG (10/-), A. Cheetham, VK2ADB (10/-); F. Pearson, VK2ACQ (10/6), A. McMahon, VK2ADM (10/-), D. Robinson, VK2AXR (5/-); H. Carter, VK2HC (10/-), D. Haberecht, VK2RS (18/-); B. Reed (N.S.W.) (10/-); Mrs. J. Reed (N.S.W.) (10/-); S.w.l. Group of W.A. (10/-).

The total subscriptions to the 31st March are: £2,115/5/0.

ZL1PPJ—SCOUT JAMBOREE'S STATION

By J. F. Freeman, ZL1VA, President N.Z.A.R.T.

The original planning of the Pan Pacific Scout Jamboree's own Amateur Radio Station had provided for the station to be set up under canvas in Cornwall Park, One Tree Hill, Auckland, and from a radio point of view this would have been most desirable. However, as plans for the Jamboree developed it became apparent to the Boy Scout Association that a large scale Exhibition was desirable under cover and so our plans were changed to fit in with this altered thinking and ZL1PPJ was found a home in the special broadcasting studio in one of the permanent buildings at the Showgrounds, alongside the Jamboree Headquarters. This was a very satisfactory arrangement as we had a weather-proof, comfortable station with power and telephone facilities provided and were in a prominent position from a public relations point of view. The main worry was, of course, the much higher electrical noise level encountered, but now that the Jamboree is over it is felt that this disadvantage was outweighed by the fact that the location enabled more members of the general public, as well as Scouts, to visit the station and learn more of our hobby.

The station operated on all Amateur bands from 3.5 Mc. down to 50 Mc and used four modes of transmission—c.w., a.m. phone, s.s.b. phone, and radio teletype.

Transmitters On 80 and 40 mx ZL1AKW's rack mounted tx was used, comprising a Geloso v.f.o. and 6146 final amp. with a multiband tank. Associated with it was all ZL1AKW's RTTY equipment which included a page printer.

20 mx: ZL1ARH's compact s.s.b. tx, which incorporates an Earnshaw Electronics Type 8A exciter, did service on this band. The p.e.p. was about 100 watts.

15 and 10 mx: On these bands two sets were used. ZL1AFW's rig (Geloso v.f.o. and 6146 final with a pi-net tank and multi-band aerial tuner) and ZL1KG's compact table-topper (Geloso v.f.o. followed by a QQV06/40 final amp.) shared the honors.

6 mx: On this band we used ZL1AKW's tx using p.p. 807s built into the same rack and using the same modulators as the 80 mx rig mentioned above.

Receivers' Various rx's were used on the several bands. They were: Collins 75A3 (ZL1AFW), G.E.C. BRT400 (ZL1AKW), R.C.A. AR77 (ZL1CH), National NC98 (ZL1ARH), and Hallicrafters S27 (ZL1MO). Also a special home-built s.s.b. rx by ZL1AAX and ZL1KG's all-band rx which uses plug-in converters. Both the latter were a real credit to their owners.

Aerials. A multiplicity of aerials topped the "Manufacturers' Pavilion"—many of them built "Scout fashion" with bamboo and rope! After all, the station was only on for nine days! We had 3 el. beams for 10 and for 15, and a two el. job for 6 mx. In addition, doublets were put up for 10, 20 and 80, while an 80 mx Windom was also used for the few contacts we had on 40 mx. Most of the 20 mx work was carried out on a ground plane.

Activities Unfortunately the period of operation proved to be a poor one from a DX point of view and we did not have as many DX contacts as we hoped for. On the 3.5 Mc. band all contacts but one were with ZL stations—one odd one was with VK9AD in Norfolk Is. on s.s.b. On 7 Mc. the main activity was the radio teletype circuit which operated twice a day to ZL1WB in Whangarei. A few other c.w. and phone contacts were had on this band mainly within New Zealand.

As was to be expected, the main DX activity took place on 20 and 15 mx with 10 mx active to a lesser degree due to the conditions prevailing. In the earlier part of the week it was the s.s.b. tx on 20 mx which brought in most of the DX but as the bands opened up later in the week the honours tended to become more even.

V.h.f. activity was limited to 6 mx. Most contacts were with ZLs but we were able to work ZL4GY in Invercargill and several VK3s in Melbourne.

By the end of the week the station had had 574 contacts in 40 countries and in all continents.

The station was on the air from 1320 hours N.Z.T. on 2nd January, 1959, and closed at 0958 hours on 11th January, the final contact being on 80 mx s.s.b. with ZL4GA in Invercargill.

Alongside the ZL1PPJ stand, which was behind plate glass windows in the broadcasting booth, another stand was laid out with examples of Amateur Radio equipment—both past and present—and this stand attracted a great deal of interest among Scouts and visitors to the Jamboree Exhibition. Possibly the greatest attraction was a Creed tape perforator upon which visitors were able to punch their own names and hear them played back on an oscillator at about 10 w.p.m.—a simple but attractive exhibit.

To conclude the story of ZL1PPJ, I feel safe in saying that those who took part, thoroughly enjoyed it all, and Amateur Radio gained a lot of worthwhile publicity. To those 574 stations who were able to contact ZL1PPJ we advise that QSL cards will be distributed through the various QSL Bureaux in the near future.

V H F

(Continued from Page 19)

1GY is heard the band is open to DU1 and DU9. Have heard him pounding in here, but there has been no sign of other DU signals. Peak reception unfortunately does not coincide with the DU-VK sked period. They listen for VK at both 1200 and 2200 EAST, times when DU1GY never appears to be at his best. The more active DU stations appear to be DU1GF and DU9VVL.

For those interested in LU and other South American stations there is an f.m. station running 5kw on 47.48 Mc located in Argentine. One active station in India is VU2RM, but there are no further details to hand about him yet. A newcomer to the band here is Blue 4EY, running 15w. to an 832A, v.f.o., 5 el. yagi and using both m.c.w and a.m. March 8 had a good Es opening to VK2, 3 and 5 for five contacts, but still no VK6.—4ZBE.

The Buderim Story.—JAs made their first appearance in force on Feb. 6 and have since been worked every day with the exception of Mar 29 when no signals were heard. Some JA signals have been strong enough to copy without an antenna on the rx, sigs to R5. Incidentally, there was one VK/JA contact in Jan., 4HD worked JA3AB on Jan. 11 at 0850 EAST, his signals 559 (A1). KH6 first came in this year on Mar. 7 and are still coming in. Number of contacts to Mar. 31 are KH6s BCF 8, CTC, UK 11, CNI, W3BJG/KH6 8, KH6CAU, K9KVV/KH6. Sigs. range all the way from 339 to 5 and 9 plus on phone. To KH6 land the band opens almost regularly at 1745 EAST for c.w. Phone from KH6UK a little after 1800. KH6 had their first opening of the year to ZL on the night of Mar. 30. Russ 9XK is also working into KH6. During the week ending Mar 31, KH6 had good openings to LU, CE, CX and TI.

W6NLZ and W6PUZ made a welcome reappearance for the first time this year on Mar. 30 at 0801 EAST. First QSO with 6NLZ at 0825, RST 335, second 0839 for 559, last 1006 for 589. W6PUZ first contacted 0942 for 339, again at 1015 for 599. Last sig. heard was W6ABN at 1055, his signals 339. The conclusion is that W signals are fewer, but peak signals higher. C.w. is a MUST. Had a scratchy contact with KR6AK, Mar. 14 at 2145. Worked Hughie VK5BC at 1245 EAST on Mar. 6, sigs. R5 S9. Still using 120w to a 100TH, a 5 el. yagi, and a c.c.c. AR7.—4HD.

NOTES

FEDERAL

OVERSEAS COMMENT OF LOCAL INTEREST

The following, from the R.S.G.B. "Bulletin", is of interest to all Australian Amateurs:—

"So that the interests of Radio Amateurs in Region III. (Asia and Australasia) shall be adequately safeguarded at the forthcoming Radio Conference in Geneva, the council of the Wireless Institute of Australia has decided to apply to the Australian Government for one of its most experienced Amateurs—Mr. J. Moyle—to be attached to the official delegation.

"The cost of sending an Amateur Radio delegate from Australia to the Geneva Conference is expected to be in the order of £A2,500, the bulk of which has already been subscribed voluntarily by public-spirited members of W.I.A. and others interested in the Amateur Radio movement in Australia. But how pleasing it is to learn from 'Break-In', the official journal of the New Zealand Association of Radio Transmitters, and from the 'News Letter' of the Hong Kong Amateur Radio Transmitting Society that members of both those organisations are also making voluntary contributions to the fund opened by the W.I.A."

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FEDERAL QSL BUREAU

The C.C. (DX Hunters' Club) in Beira, Mozambique, is again staging an International DX Contest. This year the dates and times set down are from zero GMT August 15 to 2359 GMT August 25. The contest is for both c.w. and phone. Full details have been sent to all Divisional Bureaux.

A DXpedition is being undertaken by IT1ZGY to the Pelagica Island. He will be active from 2000 GMT April 24 to 27 except, as he says, for time off for meals and smoking. Due to lack of early advice his trip will be over before these notes reach the printed stage. IT1ZGY is confident of the Pelagica Island being recognised as a new country and he hopes to be issued with the call sign 1P1AA or 1P0AA and plans to use 14 Mc. both phone and c.w. If a new call sign is not issued to him he will use IT1ZGY/1P. Address for QSLs is via IT1TAI, Box 300, Palermo, Sicily. S.a.e. will secure direct replies, otherwise via Bureaux.

The V.R.Z.A. have issued a Dutch DX Certificate. Requirements are contacts with 25 PA stations, with two PJ stations situate in different districts of the Antilles, and one PZ station. Applications with QSLs and five I.R.C. should be sent to V.R.Z.A., Box 190, Groningen, Holland. Contacts must be subsequent to December 31, 1945.

OE1HJ under date of 26 Dec., '58, bemoans the non receipt of QSLs from VKs 2FU, 2ZE, 4CG, 4ZB and 5NO.

Anyone who contacted the Chilean DX-pedition to the Chilean Juan Fernandez Islands in January last should send QSLs to R.C.C.H., Box 761, Santiago, Chile.

KZ5BB, Geo. Hamilton, writes notifying that the station was closed down in November last consequent on his return to the U.S.A. States that any station who has not received a card should apply via the W4 Bureau. George hopes to have the call sign K4AE by now.

According to HERS103, MP4DAA is located on Das Island, 130 miles s.e. of Bahrein. The owner, Andy Goodwin, says Das Island is one of the many links to the Trucial Oman States and efforts are being made in the right quarter to have Das Island recognised as a separate country. (Where will this new country racket end? Probably with the issue of a "Fly Speck DXCC" Award). Cards for Andy should be sent to Box 130, Bahrein Island, Persian Gulf.

Erik Friedmann, operator of 4X4WF, is a very thorough Ham and a stickler for minute details on his QSL card. Early post-war Erik operated SP6WF. Erik, who is a Doctor of Medicine, enjoys rag chewing as well as DX hunting and his 25 watt sig. on 7 and 14 Mc. c w is heard near and far. QTH is Box 200, Tiberias, Israel.

Unless more notes are received, these notes will appear at quarterly intervals, as writer now too busy to do much "snoopin'" and "mail reading".

—Ray Jones, VK3RJ, Manager.

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CONTEST CALENDAR

Compiled by W.I.A. Fed. Contest Com.

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OZ C.C.C.:
Date: May 3-4.
All Bands.

U.S.S.R. WORLD CONTEST:
Dates: 2100 GMT 9th May to 0900 GMT 10th May, 1959.
Rules. Elsewhere this issue.

HELVETIA 22:
Date: Third week-end of May.

REMEMB. DAY CONTEST, 1959:
Dates: Saturday, 15th August, to Sunday, 16th August, 1959.
Duration: 1800 hrs. E.A.S.T. to 1730 hrs.
Rules. As for 1958 (Watch "A.R." June 1959).

VK-ZL DX CONTEST, 1959:
Dates: Phone—1000 GMT, Saturday, 3rd Oct.—1000 GMT, 4th Oct.
C.W.—10th Oct.—11th Oct., 1959.
Rules: Overseas—as for 1957.
VK-ZL—Bonus value altered (Watch "A.R." August 1959).

"CQ" WORLD-WIDE:
Dates: Phone—Last week-end Oct. '59.
CW—Last week-end Nov. '59.

NEW SOUTH WALES

TENTH ANNUAL URUNGA CONVENTION

The tenth Annual Urunga Convention was conducted during East week-end and was attended by 36 licensed Amateurs, 2 Associates and numerous XYLs and harmonics made up as follows:

VKs 2BZ, 2EO, 2ER and XYL, 2FH and family, 2FP and XYL, 2GC, 2JS, 2PM and family, 2PY, 2RU and XYL, 2SF, 2UG, 2WQ, 2XO and XYL, 2XS, 2XT, 2ZX and family, 2ABU and family, 2ACU and XYL, 2ADN and XYL, 2AGS, 2AHA, 2AHH, 2AJQ and family, 2ALJ and XYL, 2ASZ and XYL, 2AUM, AWG 2AWY, 2ZBX 2ZCQ 2ZEL 2ZJC 2ZMO, 3ALQ and XYL, and 4GG. Associates Bob Bailey and XYL, Barry Cartwright, Norm Dash, E. Leszinsky, Ken Mattie, Snow McCawley, Harry Miller and XYL, Norm Moody and XYL, and Fred Reid.

As you can see, Urunga has not only maintained its attendance figures over the last few years, but has increased in popularity. The fellowship and fun to be enjoyed at this gathering cannot be surpassed and many have in fact already reserved their accommodation for 1960 so that they may once again renew friendships, hold post mortems on all subjects and thoroughly enjoy themselves in pleasant surroundings.

Organisation this year was in the hands of Rod Pike, 2ACU, and a committee which included Crief 2XO (the originator of the Convention) and congratulations go to them for a successful function. Particular mention must be made of their XYLs, Betty and Jean, who did so much to entertain the other XYLs.

The various competitions resulted as follows: (1) 40 metre tx hunt. 1st 2FH and Assoc. Norm Dash in conjunction; 2nd, 2PM. (2) 144 Mc. tx hunt: 1st, 2AHH. 2nd, 2PM. (3) Urunga Scramble: 1st, 2PM; 2nd, 2AHH. (4) Longest distance travelled to Convention: 3ALQ. (5) Lucky registration number: 4GG.

The 40 mx tx hunt was a new innovation for Urunga and it provided a new experience even though it was accompanied by much wailing and gnashing of teeth! Most entrants used last minute manufactured loops which were rendered useless when heavy rain fell and shorted out tuning condensers, etc. The successful competitors "talked" their way in on 40 mx whips with the aid of clues given from the hidden tx crew.

The 144 Mc hunt was much easier than in past years, mainly because the wet weather precluded the use of some forest roads. Nevertheless, some finished up in strange places, including 2AHX who finally found the tx by emerging from between two doors, one being labelled "gents" and the other "ladies"! By way of explanation, the tx was hidden on a hill which provided a magnificent panoramic view of Bellingen and the Bellinger Valley. Alongside the hidden tx was a rubbish (now perishable) dump which among other things contained two discarded buildings, bearing the aforementioned name plates. Unlike the rest of us who drove to the site, Bob had to be different and deserted his car, climbed the back of the hill on "shanks" and emerged from between the doors! Alan 2FH found the tx even though he was using a walkie talkie with a dipole antenna! A good effort Alan.

Crief and Jean Retallick again entertained us in their "Do-Me" boat shed, where Jack Gerard screened several films including one of his own taken during his recent visit to U.S.A. and Canada. The company then feasted on bananas (courtesy 2AWG), biscuits and cheese, hot dogs and of course an 809 was left with no emission whatsoever.

The official part of the Convention concluded on the Sunday night with a concert presented by Jack Gerard and a spirited auction conducted by Alan 2FH, together with a delightful supper provided by the Urunga Progress Association.

Our thanks for a successful convention are due to many people, some of whom have already been mentioned, and some who are unknown to your scribe, such as the person who kindly donated the clock which raised just over £12 for the I.T.U. Fund. We thank you all for a job well done.

Many reminiscences can be enjoyed when one thinks back over the convention. For instance, a passing pee-wit successfully dive bombed Ted 2ZX and left a dash of white right in his eye. We've got photos to prove it too! The stories that were told and experiences related will never be forgotten. If you want to join in the fun, plan now for Urunga in 1960.

—Noel 2AHH.

HUNTER BRANCH

Another Branch year is behind us—quite successful in lots of ways, but larger attendances at meetings would be more pleasing. Your President, Lionel, read his concise and excellent report after thanking the Divisional President for his attendance. Meetings were held every second Friday of the month with the exception of January. Those specifically thanked were: the College Warden for meeting facilities, Gordon Sutherland acting cum social secretary, V-P Stuart Fairbairn and Varley Fitton of disposal delivery. Treasurer Bill Hall for social evening accommodation and Bob Rose, columnist. Prior to election of officers for the year, Pierce took the chair and thanked the outgoing committee on behalf of himself and his Council.

The following were elected: President, Lionel 2CB, Vice-President, Bob 2AQR, Sec. and Social Sec., Gordon Sutherland, Treasurer, Bill 2XT; Social Treas., Bob Bailey; Liaison Officer, Stuart 2ZDF, Correspondent, 2AQR.

Speakers, both local and guest, provided a wide range of interest during the year: Hans 2AOU, rx selectivity, Bill 2ZK, atomic clocks; Lionel 2CB, s.s.s.b.; Stuart 2ZDF, Commands, Barry 2ZAG, valves and transistors; Bob 2QA, v.h.f.; Joe 2JR, this and that; Maurie 2FW, mobile, and Wal 2AXH, on tape describing slides of N.Z. It is hoped that a similar full year will be presented to you. Pierce kept his oratorial prowess within reasonable limits affording the gathering an opportunity to express their views on the agenda of the Federal Convention.

Those present included VKs 2APQ, 2XT, 2CS, 2ZMO, 2RJ, 2ZDL, 2ZDF, 2SF, 2XQ, 2AFA, 2ZL, 2AOR, 2CN, 2ANA, 2QB, 2AQR, and Associates Sutherland, McLachlan, Hall, Bailey, Jackson, Jayne, Foster, Gray, Stobbs, Hamilton and Davis. Apologies were received from 2FP. Who was it that talked into the dial of his rx instead of his mike? Congrats. to Bill 2ZL for receiving card confirming contact with Panama on 7 mega. Heard 2XT working 2FP on 40—I repeat, 40—good heavens. Mention must be made of the tape by Max Hull on the I.T.U. Fund—the oration would squeeze blood out of a stone. Those die-hards who haven't yet paid up must have turned their sets off.

Still good to hear the pips of Ron 2ASJ during 2AWX's broadcasts. What silly lengths some chaps go to in order to get their name in my notes. Your Secretary, Gordon, had an argument with a man on a motor bike and lost. However, Gordon came out of it with a few stitches where it won't show when he wears long trousers and is now doing quite well, thank you. 2XT, 2FP and XYL, 2BZ and XYL, 2AHA, 2SF and 2ZMO were visitors to Urunga Convention over Easter and despite the threatening weather, no inconvenience was experienced from same. Bill 2XT was third in the 7 meg. scramble, Harold 2AHA third in 144 Mc. hunt, whilst both these boys tied for third in another event. Don 3ALQ was there for his seventh consecutive year, whilst that Iron-horse, 4GG, got a banana for the lucky prize. Bill tells me that Crief 2XO entertained with some really good slides of N.Z. whilst

Jack 2ADN, of Coffs Harbour, flashed his 16 mills. on the screen.

Hearing that 2ZL has been beaten by all comers at billiards, Harry 2AFA paid him one of his rare visits and came away well satisfied with himself. However, Bill rehabilitated himself at the last social in the House of Hall by beating the host, but I bet you are not game to ask how Bill beat Bill.

This month's meeting will be held as usual at 8 p.m. at Tighes Hill Tech. on the 8th, while Bill Hall will challenge all-comers at the Oriental, Bull St., on 27th. We will be there, will you?

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VICTORIA

From all accounts the Federal Convention, held at Easter in Melbourne, was an outstanding success. Most of the items on the agenda were dealt with in reasonable time and with a minimum of argument. It would appear that the bigger things such as the briefing of John Moyle for the I.T.U. Conference had dwarfed all the usual contentious items into insignificance. This augurs well for our support of John in this exacting task which he has undertaken on our behalf and all that now remains is for the bulk of the members to support their representative's lead in this regard by carrying out the suggestions put forth by our Federal President in this matter. Our motto should be "do it now" before it's too late.

This year's Convention was the first to be held in the new rooms of the VK3 Division and for this reason must go down in the annals of W.I.A. history. Acting as host State to the Convention is quite a big job and congratulations are due to the organisers of this event.

As is usual, the April meeting night just past was the annual general meeting, followed by an ordinary meeting. Unfortunately, it received much the same treatment as the March meeting in that very few turned up, about 21 to be exact. As a result, the meeting seemed to lack its usual spirit and there was only a spasmodic burst here and there to break the unusual quietness. We sure seem to be degenerating into a body of couldn't-care lessers. It beats me how our office-bearers bother to carry on considering the support they get.

One of the main jobs of the night was to obtain nominations for President of the Division. Fred has completed two years in this office and has declined nomination for a third term so it was on, as the saying goes, for young and old. After the smoke and fire had died down, we were no further forward and it was left in the hands of Council.

Fred's work over the past two years as President is known to most of us and there is no denying that he has done a particularly good job of work in the true tradition of the post. He has always handled our meetings with true decorum and has never failed to produce the best in the way of lectures. These are the things the average member sees and can appreciate, but Fred has not stopped there. He has done an equally commendable job behind the scenes where few of us have seen him in action. His most exacting task was arranging the move of 3WI to the new rooms. Under Fred's guidance and the assistance of those who rallied round him the move was completed with hardly a hitch. This was no mean task and involved him in an enormous amount of work and time. A vote of thanks was passed to Fred by the meeting for this work.

Our new Council takes office very shortly also, and nine nominations for this job have been received. Last year ten was the number, so there will probably have to be a whip around to fill the quota. The final position with regard to Council and our new President will no doubt be announced next month.

The Editor of "A.R." read the Publication Committee's annual report which brought to light some interesting facts on the time spent by this committee in producing our magazine. A plea was made once again for more assistance on this committee and for more technical articles to enable this important work to be carried on in the proper manner. In some respects our magazine is akin to our frequencies in that it keeps our organisation alive, so in this, if in nothing else, we must lend our active support to the utmost of our ability.

Owing to a delay in the preparation of the Treasurer's report, the meeting was adjourned at this juncture and will be continued at a subsequent meeting.

The general meeting which followed brought forth various reports and it was noted that VK7 has taken over the duties of Contest Committee from VK5. This latter State has been carrying out this work for quite some considerable time. All reports indicate that visits to places of interest, field days, fox hunts, tx hunts and the like are still taking place, so lend your support where possible. The silent service, our bureaux, are also still very much on the ball in the capable hands of Noel Stork and Ivor Stafford, and last but not least our Council is very active if attendances are any indication. The member situation is also holding its own with a surplus of joinings over resignations and new members admitted at this meeting were R. B. Wallace (3UW), R. G. Davey (3ZEX) and J. D. Green (s.w.l.).

A busy visitor to Melbourne from the Apple Isle is Keith 7RX. He is visiting as many shacks as possible. When last seen he was swapping fishing stories with George 3AHN.

Sorry chaps, the title of the next lecture was not known at the time of writing, so listen to the Sunday a.m. broadcasts for details.

NORTH EASTERN ZONE

Stan Ferguson, of Tongala, not doing much hamming these days. More interested in t.v I think. Peter 3APF building new 2 mx beam and having quite a convention on Saturday afternoons with Ham visitors. 3KR working DX with a quad. John 3ACW has built a new shack out back and is removing from the house. We congratulate John and XYL on the arrival of another harmonic. Sid 3CI is tearing down his antenna farm for re-erection at another QTH about half a mile away. 3AGG's XYL was away at Easter, so Bruce migrated a few streets to Les 3ALE, who is moving to VK4 land in May.

From 3AUL we have the following: The zone hook-up on 80 mx is building up in numbers, but no Shepp. boys heard (shift workers, Arthur). Bill 3AHO has an 80 mx dipole in the air again and putting out a really fine signal. Vern 3AXW also a regular on 80 mx as is N.E. Councilor—Col 3WQ. George 3ADZ back again after a lengthy absence. 3UW, of Bandianna, has been welcomed to the hook-up and is also engaged in modifying an AT21. 3AUL has at last broken the sound barrier on 20 mx with KX, KH and a VK9 on phone and Ws on c.w. It is learned with regret that Jim 3JK is migrating to Mount Eliza and so from this zone we wish you the best of luck, Jim, in your new QTH and happy swapping.

From 3KR Benalla. (This I must comment on. Magazine arrived Benalla, Tuesday, letter re-

celved on Wednesday. Some pin I used to break the silence barrier!) However, Ken reports Keith 3DW is building barricades to keep junior ops. in, still manages to keep skeds on bush fire nets every Sunday and work about umpteen hours a week.

3AHF still working 80, 40 and 20 with a modified AT5 rig and BC348 rx; just returned from annual hols. to find a t.v. set installed next door. Wacko, t.v.i. and holiday smiles disappear. Bill 3JP on vacation in VK5 land, no portable equipment by order of XYL. Jack 3PF has his worries since 220 k.v.a. lines have been switched on 200 yards from his back door. Why don't you use the pylons for a rotary beam, Jack. David, the junior op. at this QTH has constructed a t.v. set which really works and gets good results using a rhombic antenna.

In closing, Ken exhorts me to use all the bands and to get on 40 every Sunday. Sid 3CI exhorts me to get on 6 mx any time, Arthur 3AUL wants me to write for the Sunday morning broadcast (I think) and the XYL wants . . . etc., etc. Haven't the space left!

WESTERN ZONE

Keith 3AKP, of Stawell, has recently completed building his own t.v. set with excellent results. He is now working on his higher powered rig, so expect to hear Keith in the near future. Chas, ex-3IB, is on the air from the Gilbert Islands with call sign of VR1B. At present he is working c.w. on the 14 Mc. band and expects to be able to work phone as well at a later date. Reg 3ZFD, of Horsham, is active on the 2 mx band and has been working with the local boys.

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QUEENSLAND

MARYBOROUGH

4AI came up on 20 mx for the first activity in months, using a dipole. He is getting a 3 el. 15 mx beam going. 4DJ has a new type of antenna, a folded quad, due to a support breaking. How's the field pattern, Grahame? Is working on a copy of the Viking table-top tx. Was there a romantic background to Grahame's recent visit to a northern VK2 40 mx station?

4GH checked up on his rx a year ago and now reports having switched on his v.f.o. No doubt the final is due to go in 1960, and a QSO should result in 1961. Can't you improve on that Gordon? New ones were worked on 15 mx by 4CB (VP3) and 4BG (FC and PZ). Arch 4CB has been heard lately on four bands but QRT at the moment with broken feeder line at the G4ZU end. 4BG lost an 866 jnr. rectifier. Wondered why only S2 sig. going out on 40 mx and found the feed line shorted out by Mum's indoor clothes line. Ron gave a talk on Amateur Radio at a meeting of the local Engineers Institute and didn't forget to stress the value of Ham work to the community. At the end of the talk invited all present to his shack. A dozen engineers turned up and had a QSO with two Darwin stations.

TOWNSVILLE

The Federal Executive is to be congratulated on the fine article in April issue of A.R. It certainly contains some juicy points for discussion at the various branch meetings. It is not just sufficient to say "Oh I have read it" and most likely missed the salient points. Take Max 3ZS' stirring appeal in his article to use the bands and to compare the findings of the Radio Inspectors and others in monitoring the bands and then cast your mind back to the last R.D. Contest, when you struggled hard through the QRM to get that coveted number to help your State along to win the trophy.

Again he mentions we have 3,500 holders of licences; think, and think deeply, about some of the call signs. Have you or anyone else ever heard them? Again the Radio Inspector's report no station to inspect. Why? Because there are some license holders who automatically get a call sign when they apply for one because they hold higher qualifications than the A.O.C.P. Others who gained the coveted A.O.C.P. came on the air for a couple of years and then tired of it, gave the game away and dismantled the station, but still pay the yearly fee for their licence. How many of the latter in your district?

The other article by ZL1AAX will certainly cause some heated arguments. Don't blame my carrier, it must be your receiver? I hope this article will clear up doubts in my mind re s.s.b.

The last meeting of the local radio club was again well attended, 16 being present. As Alan 4PS was absent, the chair was taken by John 4DD. Two new members were enrolled, namely, Mike 4OM and Associate R. Keogh. It was decided that the new Radio Handbook, 15th edition, be purchased and placed in the library for use of members; certainly the club will soon possess a very fine technical library. The Publicity Officer, Frank 4PF, outlined his ideas for bringing before the public the aim of Amateur Radio and appealed for photos of the different Amateur Stations in the district and he had obtained a good hearing with the local daily paper. The other officers of the club gave a report on their activities during the month. Keep this up and we can hold the enthusiasm of the members and they will keep on attending. It only requires a little slackness on the part of the various officials and the meetings will soon become dull and boring and attendance will drop off.

The speaker for the evening was Bob 4MF, who gave a very interesting lecture on the electrical system of the motor car, bringing along the various switches, diagrams, etc., as used on the present-day car. He also brought along a board wired up with a kitset of flashing indicators which will be used on the well known Australian car. I might say this created great interest and many questions, which he soon answered. Unfortunately, the board was kept under close security and was unable to be mislaid.

Bob 4MF was heard testing his new cubical quad and given assistance by 4PF and 4EJ. Will it beat the old beam? Eddie 4WH, Wal 4BU still not on the air after telling the boys about their re-building. I often wonder when I will hear the following local call signs on the air: 4AE, 4DH, 4HF, 4HV, 4JH, 4QZ, 4RI, 4TQ, 4WT and 4XH.

Bazil 4ZW sent along the following: A new Ham has arrived on the Tableland—4ZBJ, ex-Brisbane, and I hope he introduces new blood into the northern boys. (The T'ville gang will be glad to listen for you, John.) Alex 4MA apparently lost in the big ditch they dug near his QTH as he has not been heard. Harry 4HK heard asking details of how to apply for a licence to go portable. Look out you city slickers, and nail down your gear. Harry 4OH, the milko from Mossman, too busy to come on the air. (Remember, the more you earn, the more tax you pay!). Take time off to rag chew with the gang. Arthur 4SM now gone high power, purchased an 813, while Ted 4MH spent his surplus on fishing gear. Roy 4AX broke the long silence and spoke to 4ZW; blow some more dust out of the rig and come on more often. Claude 4ZY and Bill 4XM rag chew all night on the old days. Visitors welcome to break in. Bob 4TK recently spoke of the miss in his car and a rude interjector wanted to know what the XYL had to say? Bob also disappointed about lack of disposal gear being made in Queensland. Harry 4ZP on long service leave and spends his time monitoring the bands.

SOUTH AUSTRALIA

Following the elections last month, the following officers were appointed for this year: President, B. W. Austin (5CA); Vice-Presidents, L. F. Brice (5OK), E. C. Daw (5EF); Treasurer, C. Appleby (5ZBV); Secretary, J. C. Haseldine (5JC); Publicity Officer, W. W. Parsons (5PS); Minute Secretary, L. F. Brice (5OK); Sub-Editor, E. C. Daw (5EF); Technical Officer, E. A. Barbier (5MD); Membership Organiser, L. Duncan (5AX); Operator of 5WI, G. M. Bowen (5XU); Rep. on Moon Watch, 5XU; QSL Officer, G. Luxon (5RX); Communications Officer, Joe Kilgariff (5JT); Associates' Rep., L. Duncan (5AX); T.v.i. Committee: R. Tuck (5BT), B. Roper (5PU), C. Tilbrook (5GL), John Bulling (5KX); W.I.C.E.N. Com.: J. Haseldine (5JC), J. Bulling (5KX), B. Austin (5CA), R. Richards (5DO), E. A. Barbier (5MD); Disposals Com.: E. A. Barbier (5MD), J. Vivian (5FO), C. Appleby (5ZBV); Programme Com.: R. Roper (5PU), N. White (5ZAW), J. L. Watts (5OM).

So there you have it fellows, any problems you may have, find the committee or person they fit, and put them up. That's what the Council and Committees are for, so use them.

Apart from some changes in personnel you will note that this Division no longer runs the Contest Committee, having served its term in that capacity, such passing to another Division. We were sorry to lose the services of Norm Coltman who had done so well as Assoc. Rep. for a long time, but he had to pull out for private reasons, but promises to be around to help on occasions.

We were all delighted at the last meeting to see Joe 5JO, who attended for the first time since his illness. Joe looked fairly well, and advised starting work again, take it easy Joe and continue the good progress.

The "Tender" night drew its usual big crowd and saw an almost record volume of gear change hands under the tender care of Pansy 5PS and Norm Coltman, some quite good items were included and some bargains obtained.

After the meeting closed, Doc 5MD was taken home by a certain country member, who this time safely negotiated the complicated West Terrace turn and arrived at "the" place without any motor cycle escort. How we improve.

News from 5WC, not over plentiful, but appears that the new shack is finished, but not yet occupied, Burnie's shack being the centre for the time being. Ron 5FY has left up there, and taken up residence at Elizabeth, thus adding to that happy gang. Last heard of he was trying to work out multiple converters, etc., to be able to join the Gawler v.h.f. net. Welcome to the South, Ron.

Tubby 5NO putting in some good work recently in relaying W.I.C.E.N. tests. On one occasion he had some bother with the modulator, so fixed up some audio on the keying tube screens. Not stuck for ideas and just won't be off the air for any minor fault like that. No Sir!

Brian 5EM from Ardrossan had a peculiar complaint recently, "no background noise at all;" thought his rx was on the blink, things being so quiet. There is an idea Les, migrate to Ardrossan. Yes, Les 5AX still plagued with high noise a-la-the 50 cycle lines.

Heard on s.s.b. recently: Bram 5AB, George 5GD, Jack 5OM and with Reg 5RR and Ron 5AP on d.s.b., you can see the cult is growing, this QTH has used it for quite a while and kidding the nearest Ham into it too, so look out for him soon.

John Hemphill, 5SJ (formally 5BJ) now back in VK5 and looking for contacts on the bands with his former cohorts. Also interested in forming a t.v. section. His working QTH near Pansy, so watch out my portly friend.

Another transfer to t.v. in Adelaide is Col 5CJ, who thus leaves Mount Gambier for warmer climes.

Had a note from John 5ZAZ recently and he points out a new form of interference, but this time it is known as R.I., i.e., refrigerator interference, his fridge busts up c.w. and s.b. reception on a B28 rx. His power source is a 1.5 k.v.a. alternator with voltage regulation capable of 2v. variation from full to no load, yet when tuned to c.w. or s.b. without the fridge on all is well, but as soon as the ice box comes on, out go the sigs. His explanation being that a phase shift takes place when the motor comes on. There is an idea for a phase shift rig (Les ZL1AAX, please note).

Howard 5XA reports re Hughie W4BSB, who is an associate member of this Division and recently granted a grey beard certificate. Hughie was first licenced in 1924 and used the call sign of 3FX until 1931 when he changed to W3BSB, and became W4BSB after W.W.2 when the call districts were changed. He has been active all that time and at present wants an 80 mx contact on c.w. from Asia for W.A.C. Radio sigs. branch of the U.S.N. kept him busy during war years.

In course of a "walkabout" recently went past Austin 5WO's QTH and saw the wreck of the old tower and beam, a real bad job and a complete write off. Austin is replacing same with a new 65 ft. job with all mod. cons. ex a certain northern airfield, should be a show piece when completed. Some pictures of that and the shack for "A.R." sometime, please.

Had a visit from Gordon 5XU, Gramme 5XV, George 5EC, with some XYL and YLs recently, the highlight of which was Gordon's XYL's remark whilst we were in the workshop nattering, about an hour beyond take-off time. She popped in all sweetness and smiles to say, "Just popped in to let you boys know that we are not waiting on you".

Learned during the visit that George and Gordon are working on the "third method" of s.s.b., so there is some more interest coming up. Les 5AX is to use the "fourth" method, you couldn't place him using anything orthodox, and as a preliminary had a try out by putting his carrier on, unmodulated, with me on the same frequency on upper sideband, so that my tx modulated his carrier. Seemed to work, too, and 5WI read it as a.m. We had to be the first to try it anyway.

Doc 6MD continues to put on a slow morse session each Sunday night at 9 on 80 mx for benefit of those learning or wishing to keep up practice. A remarkable number of comments arise from all parts re this service which is well received. By the way, if you know a more complicated or difficult assortment of code groups than those he uses, send them to him. He has some beauties as it is.

News on the current classes continue to be good with a lot of keen types persisting in their studies, a continuance of activity is promised whilst these new members keep coming up each year.

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TASMANIA

The Annual General Meeting of the VK7 Division has asked me to be Divisional correspondent for the next year. I have a lot to write about this time. I hope this will always be the case. On 11th March, Bob 7AF provided a film evening in the Southern Club rooms at a social gathering. This function was a great success, and a pleasant time was had by all.

On 14th March, the Annual General Meeting of the Division, followed by the Dinner, were held. As a result of the elections to Council, and as a result of the election of officers by Council, we welcome Lon 7LJ as our President for this year. The dinner was a huge success. Considerable interest was taken by all present in a bottle of capacity 9 gals., and I am pleased to say that no residual capacity was left in same at the end of the festivities, as all the energy had been successfully transferred. Our visitors from the Northern and North-Western Zones were very prominent throughout the evening. Personally, I thoroughly enjoyed meeting them all for the first time.

At the meeting of the Southern Zone held on 1st April, we enjoyed a very fine lecture delivered by Joe 7BJ, the subject being Oscillators. The address was taped with the aid of Barney 7ZAK, and Lon 7LJ is preparing a strip of the diagrams, so that the other zones can receive the benefit of this fine lecture. We, in the south, will be very interested to learn how the lecture pans out in the other zones. We were also pleased to meet Trevor ZS5KD at this meeting. Trevor should soon have a VK7 call sign.

Considerable interest has been shown in the two playings of the tape by our Federal President, dealing with the subject of the I.T.U. Conference. Such a tape can only serve to improve the solidarity of Amateurs, and I hope that Federal Executive will more often resort to the use of tapes to keep us alive to current matters of great importance.

Keith 7RX is spending three weeks in VK3 as from 5th April. Joe 7BJ will be out of the State for three months from some time in May. Our congratulations are due to Snowy 7CH for having obtained cards in confirmation of his having worked all zones. We are anxiously awaiting the chance of seeing his Award Certificate. Peter 7PD, our Immediate Past President, expects to QSY permanently to VK4 in the near future. Our best wishes go with you Peter. Edgar 7RY has now got a tx on the 50 Mc. band and is looking for contacts. Our Patron, Len 7BQ, took part in the round up of 5th April; let us hear from you more often Len. It is alleged that Bill 7TE was heard to utter several words on the 40 mx band several weeks ago. How about a QSO, Bill? I worked W1UC the other evening; he tells me he has had his licence 52 years.

Jack 7JB tells me that he worked 478 Ws during one week-end of the recent Contest, mainly on the 28 Mc. band; a very fine effort, Jack. Ted 7EJ attended the recent Federal Convention over Easter as our delegate. Having talked to him since his return, I have not the slightest doubt that Council will receive a full and interesting account of discussions at that Convention; good work, Ted. Terry 7TT continues to put in a good signal in the south with the kitten power of 8 watts. I continue to marvel at the 100 per cent. modulation put out by Max 7MX; I don't know how you do it, Max, and without any sign of splatter. Ken 7KA is to be commended for the way in which he re-broadcast the tape of the Federal President, excellent quality Ken. Best 73 for this month, 7ZZ.

NORTH WESTERN ZONE

Well chaps here we are once again. I have just arrived home from the last zone general meeting which was held at the usual QTH. It was the best attended meeting since I have been associated with the zone, there being in all 29 bods present; hope we can do even better at the next one. Next meeting will be the usual lecture night and I believe there's plenty of interesting and instructive matter arranged for presentation, so don't miss out, especially you associates.

In addition, weekly night classes of instruction are being arranged here in Ulverstone and the organisers hope to get several associates to attempt the October exam. and pass, too, but it will have to be a concerted effort by all participants.

A tx hunt was held on 22nd March which was fairly well attended, but many more contestants are desired. Harold 7MZ and George 7XL together, were the first home on the morning run; yours truly getting sadly lost. A good picnic lunch was enjoyed by all whilst the fox, Max 7MX, sneaked off and hid once more. The afternoon hiding place proved to be about the windiest place anyone could find, but fun was had, also afternoon tea and a good chinwag.

It has been decided to hold a zone hook-up at 2000 hours each Tuesday on 40 mx, but should 40 prove unsuitable, 80 mx will be utilised. We sincerely trust fellow Amateurs outside the zone will not crowd us too closely on the band. We feel it will be a good way for associate members to follow zone doings via another medium. So don't forget, 2000 hours each Tuesday.

A collection was taken up among those present and the sum of £6/10/0 will be forwarded on to swell the I.T.U. Fund. There is still room for more donations, so anyone who reads this please do your utmost to help raise the funds necessary to send our worthy representative, John 2JU, to the Conference.

Another tx hunt is mooted for the near future, but more of that at a later date.

Our next combined zone meeting (lecture night), will be held on Tuesday evening, May 5. Keep the date in mind also the following general meeting on June 2.

HAMADS

1/- per line, minimum 3/-.

Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received by 8th of the month, and remittance must accompany advertisement. Calculation of cost is based on an average of six words a line. Dealers' advertisements not accepted in this column.

FOR SALE: AR7 Receiver, factory modified by Kingsley for Ham use. Complete with all coils, a.c. d.c. power supply, spkr., rack & circuit, £35 f.o.r. Heathkit Q Multiplier and Manual, £5. T. Rodda, Box 254, Warracknabeal, Vic.

SALE: Rola 5" Speakers with transformer, unused, 25/- each. Variety crystals, 10/- each. Send for list. Roth Jones, 131 Queen St., Melbourne, Vic.

SELL: Eddystone 680X 15-tube Communications Receiver. Built-in product detector for s.s.b., one owner, guaranteed first class order. £195. R. H. Cunningham, 384 Glenferrie Road, Malvern, Vic.

SELL: Oregon Tower with three beams, worked 267 countries. Also Hallicrafters SX28 Receiver, beautiful order. Best offers to R. Baxter, 76 Newman Ave., Camp Hill, Brisbane, Qld.

SELLING, Bargain Prices, to clear, due changed address: Pair 813 tubes, new (not Disposal); Multimeter, Palec, M30; Multimeter, Sanwa 300C, 20K/ohms/volt (new); Monimatch Mk. II., 2 units, matching device and 0-100 μA. in desk mount; Simplex Auto bug key; Monitor, phone/c.w. all band, built-in spkr.; Filter Condenser 45 μF., 1800v.w. in can 7" x 5" x 4" (for s.s.b.); Filter Condensers, Ducon, four, each 4 μF. 1000v.w.; Geloso V.f.o. c/w new tubes, 6C5 metal, 6AU6, 6V6; Geloso Pi-Net; 50-watt Mod. Tran. and Driver Tran. for 815 c/w 3 new 815s; Special "A & R" H.t. Tran., 250 mA., contin. taps from 400v. on bakelite panel for w/plugs; 425-0-425v. 300 mA.; 450-0-450v. 250 mA. with fil. wdndgs.; 10v. 6a. fil. tran.; other Trans., various voltages; Chokes, various; 9 Mc. xtal for s.s.b. exciter; Meter 0-20 μA.; Moniscope, uses 5BP1 ("CQ", Apr. '54); 1 x Birko Sol. Iron, 80w.; 1 x Scope Sol. Iron c/w Tran. (used); 1 x Scope Iron, new cond.; 1 x Engineer's Vyce, Dawn, 3½" offset, cast iron; 2 x Cabinets, accessory, 16-drawer; Co-ax. Amphenol Connectors, Socket Punches, etc., 6 x 16 ft. Dural Tube, new 1" x 16g.; 3 x 12 ft. ditto, ½" x 16g.; 12 ft. ditto, 2"; Various mA. and r.f. Meters, Tubes. All first class gear. No junk. Write for list: J. K. Herd, "Kinta," 6 Balcombe St., Mornington, Vic.

WANTED: Circiut and Handbook for No. 19 A.W.A. Transceiver No. J8786. Buy or borrow. J. White, Yates Road, Menai, N.S.W.

WANTED: Handbook for No. 122 Transceiver. Price, etc., to G. Bills-Thompson, 6a Fairmount Rd., Hawthorn East, Vic. WB 2697.

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